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The AUTOMOBILE

Belligerents Exhaust Swiss Output

Truck Factories Work All-Day Shifts—France Wants Gasoline Farm Tractors—New Magneto Industry Started in France

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GENEVA, SWITZERLAND, June 17—Since the month of November Swiss automobile factories have been working at high pressure on orders for the German and Allied armies. A difficulty is experienced in getting raw material and in many cases trucks are delivered to foreign governments without magnetos.

The Saurer company, which occupies the leading position in the Swiss automobile industry, now employs 2000 men instead of 1500 before the war, and is operating a day-and-night shift. This firm has branch factories in both France and Germany and is supplying trucks to the German, French and English governments. It is estimated that the Swiss factory is producing eighty trucks per month. The output is limited to a certain extent by the lack of raw material. A few years ago the firm brought out a gun which gave good results, but at the present time it is not producing arms.

The Berna factory was stopped entirely during August and September. Since then it has been producing trucks at the rate of thirty per month, supplying them to France, England and Germany.

The Franz company is producing fifteen trucks a month, but as this concern is under German control the entire output is absorbed by Germany.

The Piccard-Pictet company is producing but a small quantity of complete automobiles, but has accepted contracts from the Swiss and foreign governments for car and artillery parts. There is a sufficiency of this class of work to allow the company to give it out in sub-contracts to other automobile and general engineering firms.

Martini is working with an increased staff of men producing touring cars for the Swiss and French governments. All private automobile trade has been stopped and it is impossible to export to England. With warring nations all around her, there is plenty of work for the Swiss factories on automobiles, or, if these cannot be produced, on gun parts.

PARIS, June 19—Orders have been issued by the French war department that the state arsenals and private factories producing guns and ammunition must be worked to their highest capacity. In order to make this possible all the necessary men have been released from service in the field to take up their former positions in the workshops.

The effect of this order will be to make the automobile factories busier than ever. It is doubtful if there is a machine shop in France which has not for months past been working for the army or navy. The military authorities, however, had the first call on the men, and recent investigations have shown that numbers of factories, although working 20 to 24 hours a day, were 10 to 30 per cent below their maximum production. Since the war broke out all shortage of machine tools has been met by supplies from America, and only men were needed to work these tools. Under the new regulations the increase in the output of munitions will be immediately apparent, for the entire organization existed and it is only a question of putting more men to work in the shops.

French Factory Activities

Automobile factories are particularly useful for the production of shells, machine gun tripods, aeroplane darts and bombs. All these can be produced economically with practically no change in the plant. The new orders will not make any change in the purely automobile work of the factories. By reason of her heavy purchases abroad France is well supplied with trucks, tractors and touring cars. There is a high demand for aeroplane motors, also for aeroplanes, but the factories specializing in this class of work are able to meet requirements.

Few Trucks Destroyed

During the present stage of the war the loss of automobiles is not excessive and is not likely to become so unless some dramatic military situation develops. So far as France is concerned, American manufacturers need not expect any important renewal of orders for trucks and cars. The army is well supplied and big reserves of automobiles are held. A serious reverse or an important success could so change the

Aultman and Taylor gas tractor from Ohio hauling a plow in France

conditions of operating that losses of trucks would be increased and more orders would have to be placed, but until that occurs France need not be expected to come into the market for a further big quantity of automobiles.

American Tractor Trade

Recently the Knox company's four-wheel-drive tractor has successfully passed army tests and an order has been placed for early delivery. The three-wheel type of tractor did not meet the approval of the French army authorities.

The four-wheel-drive tractor, which is a special proposition and very highly thought of by French military authorities, can only be produced in France in limited quantities and is not made at all in other European countries. Hence there is always an opportunity for America to supply more of this type of vehicle.

Light-Truck Orders

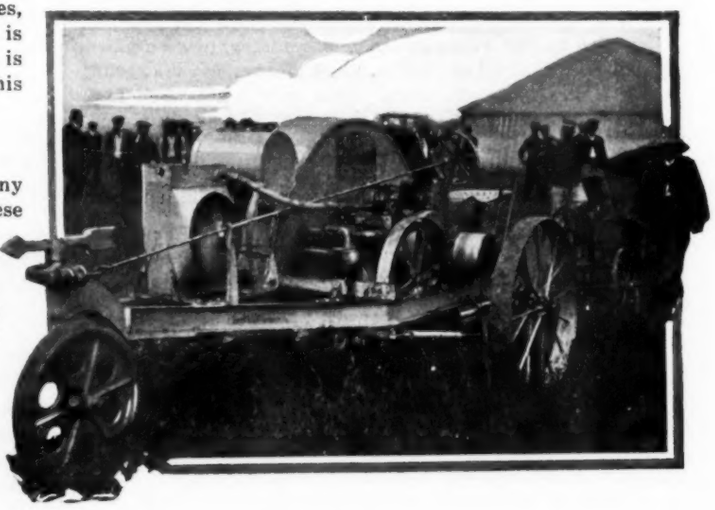
Orders have also been placed with the Jeffery company for light trucks running on pneumatic tires. Many of these have already been delivered. The French factories have supplied thousands of this type of automobile, for it is nothing more than a stout touring car chassis, and is made use of for light haulage and ambulance work. They might have been produced by the home factories, but the view of the authorities evidently was that it was cheaper to buy abroad than interrupt the shell making of the automobile factories. It can be taken as absolutely certain that when more automobiles are needed in the French army they will be secured from America, for it is better policy the keep the factories running uninterruptedly on shells than to switch them backward and forward from ammunition to cars. This, however, does not prevent the car departments of certain factories working at constant pressure for the army. The point is that when bigger numbers of automobiles are required an attempt is not made to get them out of the home factories, but recourse is had to America.

France Buys Direct

It is interesting to note that so far as France is concerned a comparatively small number of American firms have been able to get orders. The complete list of these firms is doubtless as follows: White, Pierce-Arrow, Packard, Kelly-Springfield, Jeffery quad and truck, Knox quad, Sternberg, and one make of American caterpillar tractor. There are scores of other American firms which have automobiles in army service in France, but they have never secured direct army contracts. Ford, for instance, has some hundreds of model T chassis in ambulance work, but it does not appear that the French army has ever bought one of these automobiles.

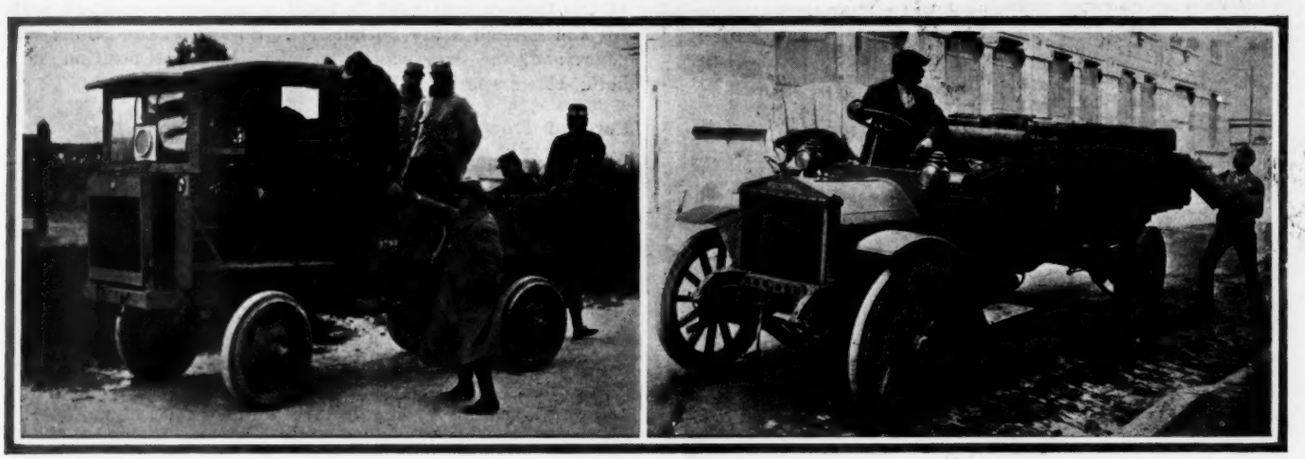
The English and the Canadians have bought and brought over all kinds of American trucks and automobiles, for much of their business is done through intermediaries. From the beginning the French war department has sought to keep the purchase of automobiles entirely in its own hands and has so well succeeded that it is hard to find an intermediary who has gained admission to the offices in the Boulevard St. Germain. A lot of enterprising salesman have come to Paris with catalogs and samples, but have sooner or later come to the conclusion that London and Petrograd are better places of business.

One field open right now to the American manufacturer is



Light Bull tractor which met with the approval of the French agriculturists

Bullock gasoline tractor being demonstrated to a French farmer



French officers on one of the Jeffery Quad trucks

Sending finished shells away on an American truck

the supply of agricultural gas tractors. There is and will be for a long time a dearth of agricultural labor and this shortage can only be met by the use of motor tractors. The French farmer is ready to adopt such machines. For 6 years he has been carefully educated to the value of gasoline on the land, this work having been undertaken by both automobile and farmers' associations, and if the average farmer has not broken away with tradition he has at any rate been convinced in his own mind that at some date he would have to make use of motor traction in his fields. The war has determined that that date shall be the year 1915.

Farm-Tractor Demonstration

As an indication of the seriousness with which this problem is being studied, a practical demonstraton of gas tractors in use on the land was made a few days ago in an important agricultural district 40 miles to the southwest of Paris. It is a mighty difficult matter at the present time to get up any demonstration in France which does not have the prosecution of the war as its direct object. Thus it is most significant that this event should have been attended by an official delegate from the Ministry of Agriculture, by French staff officers, by officers attached to the corps charged with the work of relieving civilian distress, and by the leading farmers of the surrounding country. The demonstration had been organized by the enterprising French agent of an American machinery company and comprised five makes of machines, four of which were entirely suitable for French conditions. Immediate business will be done here, and furthermore it will be of a permanent character.

French Farmer Slow

It must not be supposed that because the French farmer is now buying or intends to buy gas tractors that he is in the market for touring cars. It is a difficult matter to hurry the French agriculturalist into luxuries, and while a farmer is ready to believe that a tractor is a good business proposition, it will take a lot of argument to convert him to the use of a car for ordinary traveling.

Immediately after the war there will be an opportunity for the American automobile manufacturer to secure some business in France, but that business will not be done among the purely agricultural classes. Particularly, if the war ends abruptly, French, and indeed all European factories, will be unable to meet the demand for touring cars. This gives the American an opportunity to step right in, but advance arrangements will have to be made in order to do so.

There is also the fact that Germany will no longer be able, in view of public opinion, to market her wares in France. Her hold on the French automobile business was not great, but it is nevertheless worth considering. More important is the accessory business, of which Germany held a big share. This market is entirely open to America. The French do not excel in tools and accessories, Germany who held much of the business, will be wiped out, England will be too busy in other directions, and there is moreover, a very favorable impression toward this line of American products.

The prospect of after-the-war supply of American trucks to France is not brilliant. Whatever the conditions of peace, there will be more gasoline haulage after the war than ever occurred before. But the fact has to be faced that some thousands of trucks of both French and foreign construction will be released from military service in fairly satisfactory condition. These will be sufficient to meet civilian requirements for a year, perhaps more, and certainly until a return to normal working conditions.

As a result of the war the French army authorities will extend the truck subsidy scheme, thus making it impossible for foreign manufacturers to compete with home firms. One of the leading American firms doing touring car business in France and selling war trucks in various parts of Europe is so sure that development will be on these lines that no attempt is being made to cater for the ordinary French trade.

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Founding Magneto Industry in France

PARIS, June 15—France is through with German magnetos. How near she was to the disaster of a magneto famine and how cleverly she made herself independent of products from across the Rhine is one of the best stories related in connection with the industrial organization of the war.

Last November the shortage of magnetos had become so serious that the Minister of War called in Louis Renault, the leading automobile manufacturer of France to ask him to suggest a solution. At that time the factories were working at full pressure, 22 to 24 hours a day, and seven days a week. Gnome and Renault were each producing nearly 100 aeroplane motors per week; Clerget, Salmson, Anzani, Le Rhone were building smaller quantities. These special aeroplane motors could not be bought in America, or indeed from any other European country. Every factory in France capable of making heavy or light trucks was employed to the utmost of its capacity. The touring car factories were producing such cars as were required and at the same time specializing on shells. Neutral Switzerland was filling truck orders for France, but only accepted the orders on condition that delivery should be made minus magneto. Italy, until the moment she declared war, was in the same position.

Louis Renault's reply to the Minister of War was that he could not personally undertake the construction of magnetos,

Top—English truck employed for work in the French army
Center—Jeffery Quads going through Northern France into Belgium
Bottom—Convoy of requisitioned Saurer trucks on the road in France

but he suggested a means whereby an immediate and permanent remedy could be secured. Within an hour of that interview an order was signed calling out of the firing line Soldier Dutreux, who from the first day of August to the beginning of November had been shouldering a rifle. Under the blue-gray uniform of Soldier Dutreux was a former manager of the Dunlop Tire Co., a director of the S. E. V. electric lighting company, a successful business manager of the Panhard-Levassor Co., in a word, one of the best organizers and business managers of automobile France.

When the war broke out the French government had sequestered, in common with all other German property, the factory and offices of the Bosch Magneto Co. in Paris. A complete inventory of the stock was taken by a public receiver, the Bosch sign was removed, and the French manager of the factory continued to build magnetos on a small scale for the French army authorities. So far as the public was concerned, the firm was in exactly the same position as a bankrupt company in the hands of an official receiver.

Foreman from the Front

Soldier-manager Dutreux received army orders to lay down his rifle, take charge of the Bosch factory and produce the greatest number of magnetos in the shortest possible time. Probably the efforts of such a capable manager would not have been productive of great results but for the forethought of the French war department. For the last eight or nine years the French army has held an annual truck competition, the successful vehicles in which were eligible for State subsidies. So successful has been this scheme that every truck maker in France takes part in it, and the last competition brought to a close by the declaration of war, had united 150 vehicles. One of the stringently observed clauses of this competition was that the whole of the truck must be produced in France, of French material, by a firm under French management. As an example, the Goodrich Tire Co., which supplied some of the rubber tires for these trucks was only eligible for this work by reason of having a French factory, obtaining its supplies from French sources, and working under the control of a technical director amenable to French military laws.

The Bosch company supplied a large proportion of these truck firms with magnetos, but those magnetos were constructed entirely in the Paris factory, and the whole of the material used in their construction was produced in France. Further, although the company was under German control, the technical head of the Paris factory was a Frenchman eligible for military service in the French army. The severity of the competition guaranteed the French-made magnetos being equal in every respect to those built in Germany; failure from any cause entailing disqualification, the individual manufacturers would have refused to fit a magneto which did not possess every guarantee of excellence.

Made Complete Magnetos

By this arrangement Manager Dutreux was in charge not merely of an assembly plant, but of a small, efficient factory producing complete magnetos. Starting in on the first day of November, Manager Dutreux had so organized his forces that on the first day of January the output of the factory was three times greater than it had been at any previous period of its history. The supply was sufficient to meet all the demands for aviation motors delivered to the French and several of the allied armies, France is supplying Belgium, Russia, Italy, and England to a small extent, and left a margin for trucks and touring cars.

The seriously threatened magneto famine had been averted. When the men were wanted for this work, an order signed by the war department brought them out of the trenches; if supply houses were hanging back in the matter of deliveries, the war department supplied the men from out of the ranks and requisitioned the material if it could not be obtained otherwise. Every man in the magneto factory, from the managing director to the caretaker, was under military orders. They had cast off their uniforms, but they had not been freed from military obligations. Instead of the cent a day they were entitled to draw in the firing line, they were paid the same wages as before the war.

While this work was in progress, plans were being laid which would make the French automobile and allied industries independent for all time of German magneto supplies. Two years ago Louis Renault founded the S. E. V. company for the production of electric lighting and starting outfits for automobiles. Eight other French car manufacturers were associated with Renault in this work. It was this company

(*Continued on page* 59)

Maxwell — Mercer — Duesenberg July 4 Winners

Sioux City

Rickenbacher in Maxwell first, averaging 74.7 m.p.h.

O'Donnell, Alley and Chandler, all in Duesenbergs, made 74, 71.25, and 65.85 m.p.h., respectively.

Orr's Maxwell was fifth at 64.40 m.p.h.

Shrunk's White averaged 61.20 for the race.

Tacoma

Ruckstell in the Mercer won the 250-mile Montamarathon at 84.5 m.p.h.

Pullen sent his Mercer over the finish line in the 200-mile race for the Golden Potlatch Trophy a winner at 85.2 m.p.h.

Parsons duplicated his feat of last year in winning the 100-mile Intercity.

Omaha

Making the highest average of any of the July 3, 4 and 5 races, Rickenbacher sent his Maxwell over the route to victory at 91.74 m.p.h.

O'Donnell made a good record with his Duesenberg—86.16 m.p.h. after a speed duel with the winner.

Orr's Maxwell took third place handily with an average speed of 82.3.

MAXWELL, Duesenberg and Mercer racing cars shared the leading honors of the speedway events held on July 4 and 5 at Omaha, Tacoma and Sioux City. Maxwell's were first at Omaha and Sioux City and Mercers won two of the three races at Tacoma. Duesenbergs took second prize at Omaha and second, third and fourth at Sioux City. A Maxwell was third at Omaha and fifth at Sioux City.

Highest Speed at Omaha

From the point of view of speed the record made on the little 1.25-mile board track at Omaha was far above those made at either Tacoma or Sioux City, although below the 97.58 m.p.h. recorded at Chicago, June 26, being 91.74 for Rickenbacher's Maxwell. Second and third drivers were well up, O'Donnell's Duesenberg averaging 86.16 and Orr's Maxwell 82.3. One reason for the speeds being lower than those at Chicago was that the drivers were afraid to open up too much on the small track for fear of losing control.

The results of the various races bring out strongly the value of the plank surface as a promoter of high speeds, the Omaha averages as well as those at the newly boarded Tacoma track being well above those made on the dirt track at Sioux City. It is evident that the board surface offers much better and more uniform traction with less tendency to skidding than the dirt track. It also gives the drivers greater confidence and enables them to get higher efficiency from their cars.

At Tacoma the speeds were 85.2 m.p.h. for Pullen's Mercer, winner of the 200-mile Potlatch race with 85 m.p.h. for Cooper's Stutz which was second, 79 for Ruckstell's Mercer in third position and 78.8 for Oldfield's Peugeot. In the Montmarathon over a 250-mile course Ruckstell's Mercer averaged 84.5 m.p.h. with Cooper's Stutz a close second at 84.22 and Pullen's Mercer third at 84.20. Burman and Oldfield in Peugeot's made 79.5 and 75.8 m.p.h., respectively. In the Intercity 100-mile event Parsons averaged 79.5 in his Parsons special, while Elliott in the Gordon was second at 74.7, the other averaging under 65 m.p.h.

At Sioux City Rickenbacher averaged 74.7 m.p.h., and O'Donnell's and Alley's Duesenbergs were close behind with 74 and 71.25 m.p.h., respectively. Chandler's Duesenberg made 65.85; Orr's Maxwell, 64.40, and Shrunk's White, 61.20.

Three Fatal Accidents

Three deaths marred the July 3, 4 and 5 racing this year, Billy Carlson and his mechanician Franzen being killed at Tacoma when a tire blew out on a turn and threw their car over a 30-ft. embakment. Franzen was killed instantly and Carlson, though rushed to a hospital, died without regaining consciousness. The third death was that of C. C. Cox, who drove the Ogren at Sioux City. Cox swung out to permit Rickenbacher to pass at the same time that another car was coming up behind which forced Cox to swing back again, and in so doing he struck wheels with Rickenbacher which threw the Ogren through the outside fence where it turned over. Cox was injured on Saturday and died on Sunday. His mechanician, McGraw, was also injured.

Maxwell Leads at Sioux City

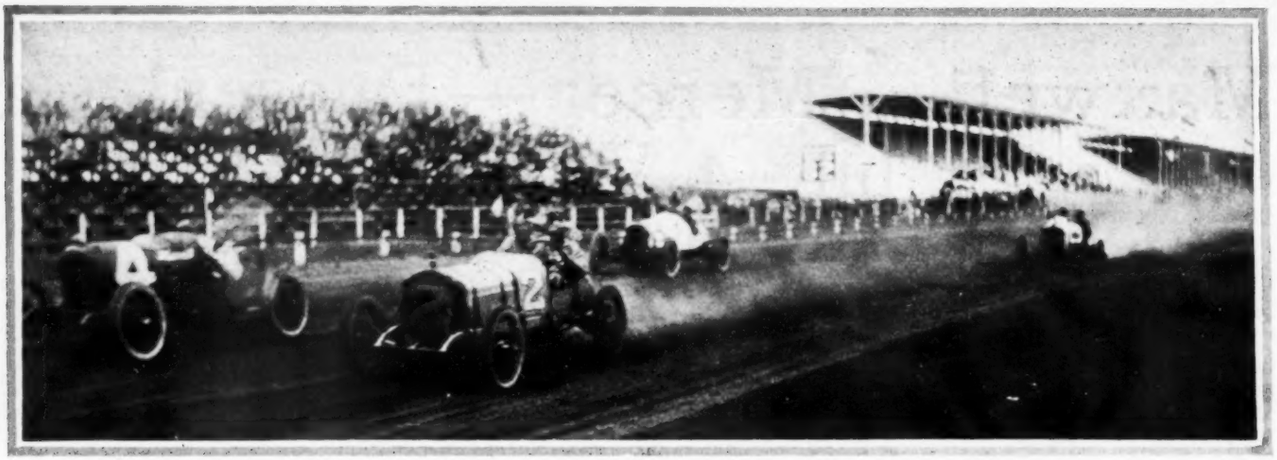
SIOUX CITY, IOWA, July 3—Rickenbacher, driving a Maxwell, won the 300-mile race here to-day on the 2-mile dirt speedway at an average of 74.7 m.p.h., a speed relatively slow in comparison with Indianapolis and Chicago speedways and also slow as compared with a speed of 78.8 m.p.h., made a year ago on this same dirt speedway here by the same Rickenbacher when he won on a Duesenberg. To-day the track was slow, due to incessant rains and scarcely more than 25 miles of the 300 were covered when the home stretch and one of the turns began breaking up and from that time to the finish the race was a severe test of the skill of the drivers and the stamina of the cars. The test to which the cars were put by this unusual track condition is best explained by the fact that of the fifteen starters which were sent away at 12.30 sharp, only six were able to finish the 300 miles by 5.30 p. m., the time set for the completing of the three centuries. The track was in good shape at the start but the 75 m.p.h. pace soon proved too much for it.

Finishers at Sioux City Race

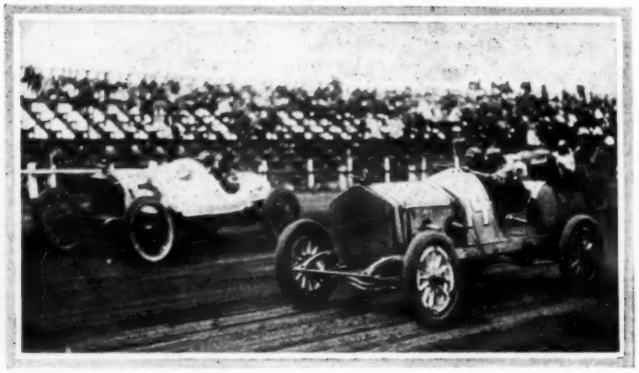
CAR	DRIVER	TIME	M.P.H.
Maxwell	Rickenbacher	4:00:56	74.7
Duesenberg	O'Donnell	4:03:21	74.0
Duesenberg	Alley	4:12:31	71.25
Duesenberg	Chandler	4:33:21	65.85
Maxwell	Orr	4:39:40	64.40
White	Shrunk	4:54:08	61.20

A Neck-and-Neck Race

To-day's race is the first important victory for Rickenbacher since he won on this speedway a year ago. He did



Rickenbacher in the Maxwell leading Shrunk in the White on the Sioux City dirt speedway



A lively brush between Alley's Duesenberg and the National in the Sioux City 300-mile race

not have matters at all his own way to-day. In fact it was a neck-and-neck race from start to finish with a Duesenberg entry, driven by O'Donnell. During the 300 miles the Duesenberg was never a lap behind the one leader and for 10 miles O'Donnell led Rickenbacher's Maxwell. At the finish O'Donnell was less than 2¼ min. behind the Maxwell. The fight between these two leaders might have been much closer had it not been that the Duesenberg was handicapped by a broken water pump which made it necessary to run the last 4 miles of the race without water. Rickenbacher's time for the 300 miles was 4:00.56, and O'Donnell's time was 3 min. and 21 sec. slower, his average being exactly 74 m.p.h.

Duel Between Rickenbacher and O'Donnell

These two contestants, Rickenbacher and O'Donnell, made the race from start to finish, and there were no other serious contenders for first or second place at any time.

Third honors went to Alley, driving another Duesenberg, who averaged 71.25 m.p.h., and was over 12 min. behind Rickenbacher. Alley ran consistently 6 miles or three laps behind the leaders, and nearly 20 min. ahead of the remainder of the field.

Chandler, in a third Duesenberg was fourth, at an average of 68.85 m.p.h.; a Maxwell driven by Orr was fifth at 64.40 m.p.h., and a local White, driven by Shrunk was sixth, averaging 61.20 m.p.h. These six were all the cars that finished. The performance of the Duesenbergs finishing second, third, and fourth was the feature of the race, after the duel between Rickenbacher and O'Donnell.

Donaldson in the Emden and Cooper in the Sebring were flagged while they still had several miles to go; and the remaining seven of the fifteen starters dropped out, five of them being eliminated before the 70-mile mark was passed.

Of those eliminated Resta in his new Peugeot, winner of the recent Chicago race, winner of second place at Indianapolis, and winner of the Grand Prize and Vanderbilt Cups at San Francisco, was looked upon as the greatest disappointment, as this entry played a major part in attracting many of the 20,000 spectators. Resta was never a factor, in fact, he never seemed interested in the race. He considered the course dangerous, and was out at the end of 12 miles with a broken oil lead and a broken bolt in a crankshaft bearing. While running he did not at any time appear to challenge Rickenbacher and O'Donnell, who led from the start.

One Fatal Accident

Only one accident marred the race. C. C. Cox, driving the Ogren, was injured and his mechanic, McGraw, also injured when Cox swung out to permit Rickenbacher to pass. At this moment Cox saw another car coming up behind and swung back again, but in doing so struck wheels with Rickenbacher, which threw Cox to the side, the car going through the outside fence and turning over. The wheel on Rickenbacher's Maxwell was slightly damaged, the most serious aspect of it, however, being the delay to change. Rickenbacher almost had to go through the fence to avoid crashing into the wreck. He was able to keep his car from upsetting and continue the race without losing the lead. Cox had his right leg broken, together with some ribs fractured, and the mechanic sustained fractured ribs and dislocated shoulder. Cox died of his injuries on Sunday. His mechanician is expected to recover.

Rickenbacher Takes the Lead

In the duel between Rickenbacher and O'Donnell, Rickenbacher took the lead at the end of the first lap and was at once pursued by O'Donnell's Duesenberg, together with Alley in the other Duesenberg. Resta's Peugeot was back in the field. At the end of the second lap the three leaders were making a runaway from the rest of the field and had lapped some of the other entries. Resta was running in seventh place. At this early point in the race the Sebring stopped at the pits as did the National entry.

Alley a Close Third

At the end of 20 miles Rickenbacher was leading O'Donnell's Duesenberg by fewer than 10 seconds, the Maxwell having averaged 75.5 m.p.h., or covering the 20 miles in 15.42. Alley, in the second Duesenberg, was less than 1 minute behind the leader. Resta's elimination at the twelfth mile was due to two causes, first a broken oil lead, and second a broken center bearing bolt which holds the outer ball race for the ball bearings carrying the crankshaft into position. The main oil lead had a rubber connection at its lower end and it

was this connection which punctured, allowing all of the oil flowing through it to drop outside of the motor.

O'Donnell 10 Sec. Behind

At the end of 40 miles Rickenbacher had his Maxwell still in the lead having averaged 78.9 m.p.h. O'Donnell had his Duesenberg but 10 sec. back of him and the second Duesenberg was trailing less than a minute back of the Maxwell. Soon Alley had to stop at the pits for some motor adjustment which placed him three laps behind, which did not endanger his third position as he was running more than 6 miles ahead of the rest of the field.

Sixty miles saw Rickenbacher, O'Donnell and Alley, running one, two, three, and miles ahead of the others. At this point the Maxwell averaged 76.6 m.p.h., O'Donnell was now 20 seconds back and Alley 6 miles back. O'Donnell all the time was making a persistent fight to overtake the speedy Maxwell but the dirt turns were getting so badly cut up and the home stretch was so rough that it was dangerous to attempt passing at this speed.

At 80 miles the positions remained unchanged, Rickenbacher averaging 76.6 m.p.h., O'Donnell was holding his position, Alley was 5 miles back, and 8 miles to the rear came the next group of drivers led by Orr in the Maxwell with Chandler in the third Duesenberg pursuing him. The White, Emden, Sebring, and Mulford were trailing.

By leading at 100 miles Rickenbacher won the $500 prize for premier position at this point, his average being 77.55 m.p.h., and his time for the distance, 1:18:24.30. O'Donnell was 1 min. and 16 sec. behind him.

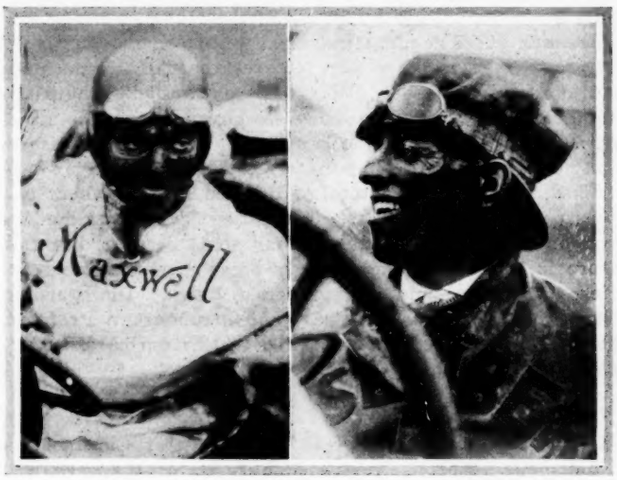
It was soon after this that Rickenbacher's collision with Cox nearly cost him the race and when he was signalled to stop at the pits and change the damaged wheel, many of the spokes of which were loose, O'Donnell took the lead, passing the pits just as the Maxwell was getting out after changing the wheel. The Duesenberg lead was short lived as Rickenbacher had his Maxwell in the lead in less than 2 miles, due to O'Donnell having to stop at 116 miles, to replace a punctured tire.

O'Donnell Struggles to Keep Lead

From 116 to 126 miles there was a neck-and-neck struggle between Rickenbacher and O'Donnell, with O'Donnell leading at 120 miles with a margin of less than 2 sec. and maintaining an average of 78.5 m.p.h. Rickenbacher was able to take the lead at 126 miles and was never headed from that point. At 130 miles he had increased his lead to 16 sec.; at 140 miles it was 26 sec., the average maintained being 75.3 m.p.h. At this time the course was getting rough with dust rising in clouds on the turns. On the home stretch the best part of the track for the cars, was a narrow one, well toward the outside fence. Some of the slower cars started driving on this track and several of them had to be signalled in by the officials because that was the part of the track on which the higher speed cars should travel. Because of this trouble some of the faster cars had to pass on the wrong side, namely next to the pole. At 148 miles Rickenbacher was signalled to stop and cautioned against passing on the wrong side, and it was while he was being warned that O'Donnell came down the stretch and it looked as if he would take the lead from the Maxwell, but instead he pulled into the pits for his first stop and the Maxwell was able to maintain its lead. O'Donnell replenished with gasoline, oil and water in 10 sec.

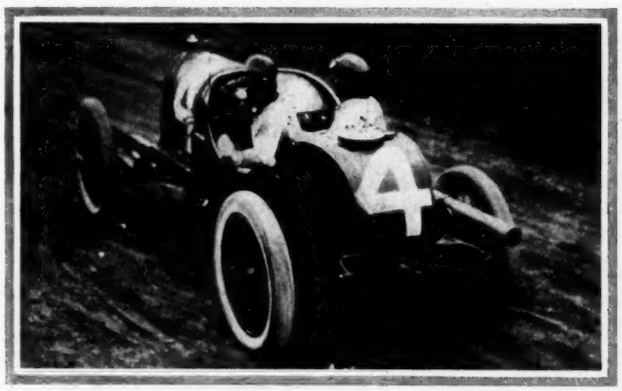
Rickenbacher Still in Front

At 160 miles Rickenbacher was averaging 74.3 m.p.h., with his Maxwell. O'Donnell was 1 min. and 20 sec. behind him, and Alley was holding the other Duesenberg in third place 6 miles to the rear. The other positions were Orr's Maxwell, Chandler's Duesenberg, and White, Emden, Sebring, and Mulford bringing up the rear at a pace of 40 m.p.h. None of the trailers had stopped at the pits up to this time, and as there was the silver trophy for the car running the greatest distance without a stop the rivalry among these trailers was interesting. Orr surrendered his chances by stopping at 172 miles, White stopped at 192, thus letting Chandler win with his Duesenberg by making 224 miles at which time he made



Left—Rickenbacher at the wheel of his winning Maxwell after the Sioux City race

Right—O'Donnell, second in the Duesenberg at Sioux City at the finish



Rickenbacher leaving the pit at Sioux City and shaking his fist at an official who warned him to keep to the outside of the track

Dimensions and Equipment of Sioux City Winners

No.	CAR	DRIVER	BORE	STROKE	DISP.	CARBURETER	PLUGS	TIRES	OIL	WHEELS
4	Maxwell	Rickenbacher	3.75	6.75	292.2	Zenith	Bosch	Nassau	Oilzum	Houk
1	Duesenberg	O'Donnell	4.375	6.00	360.48	Schebler	Bosch	Riverside	Oilzum	R-W
3	Duesenberg	Alley	4.375	6.00	360.48	Master	Rajah	Riverside	Oilzum	R-W
11	Duesenberg	Chandler	3.98	6.00	299.00	Schebler	Rajah	Nassau	Oilzum	R-W
6	Maxwell (Six)	Orr	3.75	6.75	292.2	Master	Bosch	Nassau	Oilzum	Houk
2	White	Shrunk	4.6	5.75	447.0	White	Bosch	Silvertown	Monogram	R-W

NOTE—All cars were equipped with Bosch magnetos and carried Hartford shock absorbers and motometers.

his first stop, taking on fuel. Up to this time the Duesenberg and White had been running in the same lap the entire distance.

From this point, 160 miles, the position of the leaders remained unchanged until the end of the 300 miles. Rickenbacher led at the end of 200 miles, taking the $500 money for leadership at this point. His average was 74.5. O'Donnell's Duesenberg was 1.5 min. back.

When the finish of the 300 miles came, Rickenbacher's lead was just 2 min. and 14 sec. on the Duesenberg. The Maxwell's average was 4.1 m.p.h. slower than the time made by Rickenbacher a year ago when he won with a Duesenberg.

Mulford's Car on Fire

Ralph Mulford in his Mulford special, who had reduced his speed to about 35 m.p.h., caught fire 98 miles from the finish, the Emden and Sebring being the only other cars running at the finish.

Sioux City Track Hard on Cars

SIOUX CITY, IOWA, July 3—That a dirt speedway deals death to motor car mechanisms and that only cars of quality and stamina can withstand the terrible grind, especially if the track is not in good condition, was proved conclusively at the second annual 300-mile race at Sioux City, July 3.

Running at 75 m.p.h., it required well-made cars and good drivers to finish in the money, for every part of the machines had to come into service. Vibration was carried to the maximum, side strains on the turns were heavy, taxing the steering mechanism and the wheels greatly. It was a surprise to many of the officials and spectators that as many as six cars finished, these making a total of thirteen stops or about two stops per car for 300 miles. The entire fifteen cars made a total of sixty stops or exactly four stops per car, but this figure is brought so high mainly because of two local entries, a National and a redesigned Buick. Disregarding these two cars, which really were not fit to start in a contest, there were thirty-one stops debited to thirteen cars, an average of three stops per car.

Track in Poor Condition

In the board and brick speedway races, at Chicago and Indianapolis respectively, the high speed of the cars was mostly responsible for the pit stops, but at Sioux City, where the average speed was much lower, it was the poor condition of the track which made riding difficult, though on the whole the cars which finished in the money made a remarkable showing. The motors were taxed excessively because most of the drivers used a rear axle reduction not fit for the track. There was only one car with a 3 to 1 axle, the remainder having 2.75 and under.

The track was badly rutted and made pulling at any reasonable speed a difficult matter and in not a few cases did drivers have to shift to an intermediate speed to pull out of the bad spots. This gives one an idea of the roughness of the course and the really good performance of those cars and drivers which won prizes.

Why the Cars Went Out

The first car to abandon the race was Resta's Peugeot, which was disabled on the back stretch because of two things. The center bearing, which is of the ball type, had its outer race held in position by four bolts. One of these was broken before the car started and the remaining three were sheared allowing the bearing to turn upon its support in the crankcase. Aside from this the main oil lead became punctured allowing the lubricant to flow into the mud pan and thus become wasted. Resta went out before finishing 14 miles and it was thought by many that the driver abandoned the race because he feared the track was not safe.

The next car to leave the course was the O. C. special, driven by Shea, a local driver. He retired in his twenty-sixth mile with a complication of troubles. He had separate exhaust pipes and lost one of them, also his valves were giving trouble and the motor was firing on two cylinders only.

A National entry driven by a local man went out in its sixtieth mile with a loose connecting rod, an overheated motor, and carbureter trouble.

Rickenbacher Made Three Stops

Rickenbacher, who carries away $7,000 in prize money, which includes first and $500 each for leading at 100 and 200 miles, made three stops in all, losing a total of 2 min. and 25 sec. His first stop was made in his 66th mile when he came in with a flat right rear tire. The next stop was made in the 104th mile when he came in to change a left rear wheel which became badly damaged when it was previously struck by the Ogren's right front wheel. Advantage was taken of the stop and all tanks were filled. The tire was not blown but became defaulted because of a slow leak or puncture. Oil was also taken on. Rickenbacher's last stop was made in his 148th mile when Starter Wagner called him in for advice. Rickenbacher was passing cars on the left side instead of the right, but this was necessary apparently, because many of the slower cars in the race were piloted by men who did not know the rules. These drivers kept to the outer rail instead of the inner causing the fast cars to pass on the left side, or slow down to 50 m.p.h., with possibly dangerous complications.

O'Donnell Lost Only 1 Min. 60 Sec.

O'Donnell in a Duesenberg, who finished second, lost only 1 min. and 60 sec. during the entire race. His first stop was made in his 150th mile to fill all tanks and his second in his 218th mile for water. O'Donnell never changed a tire. His second stop would not have been necessary had not the water pump sprung a leak. It appears that a small hole became enlarged because of the excessive pressure, and water was being lost at a great rate.

Alley Made Three Stops

The Duesenberg which finished third, driven by Tom Alley, made three stops, losing a total of 4 min. 6 sec. The first of these was in the 198th mile for water and oil, the second in the 222d mile for clutch trouble. The clutch was slipping badly and after treatment with rosin it held without trouble. The third was made in his 278th mile for a right rear tire which had blown and also water and oil.

Tom Orr in a Maxwell drove a consistent race, stopping but twice, once in his 168th mile for supplies and again in his 226th mile for two new spark plugs and water and oil. In all he lost about 7½ min. at the pits.

The only local entry to finish in the money was the White six driven by Shrunk and he made two stops, the first at 180 miles for supplies and the second at 276 for water and oil and universal trouble. Shrunk was at the pits a total of 9 min. 5 sec.

Emden, Sebring and Mulford Still Running

The Emden, the Sebring and the Mulford were running when the race was called at 5.30 p. m. The first-named finished 290 miles and stopped three times, the first at 120 miles for lubricating trouble, the second at 168 miles for

Mercer Dual Winner at Tacoma

Pullen and Ruckstell, the Mercer drivers who won the Montamarathon and Potlatch races at Tacoma, making 98 m.p.h. on the newly planked speedway

supplies, and the third at 182 miles for new spark plugs. A total of 5 min. 52 sec. was lost.

The Sebring lost about 13 minutes and made seven stops at the pits, the first at 22 miles for water, the second at 56 miles to repair an oil leak, the third at 68 miles with a slipping clutch, the fourth at 80 miles with an oil pump leak, the fifth at 100 miles with clutch trouble, the sixth at 134 miles with the same trouble, and the last at 196 miles for water and oil.

Mulford, driving the same car he piloted at Chicago on June 26, made a total of eight stops, losing in all 23½ min. The first stop was at 36 miles to change all four tires from Silvertown cord to Nassau. His second stop in his 44th mile was caused by a broken radiator which caused overheating troubles until the time the race was called. Carbureter trouble also developed and because of the overheating the plugs had to be changed in the 88th mile.

In the Way of Equipment

Every car which finished in the money used a Bosch magneto and Bosch spark plugs with the exception of Tom Alley and Chandler who used a Bosch magneto and Rajah plugs. The race was won with a Zenith carbureter. Nassau tires were used by Rickenbacher, by Chandler who finished fourth, and Orr in fifth position. All cars starting used Hartford shock absorbers and Boyce motometers.

William Carlson, Maxwell driver, who was killed in the races on the Tacoma 2-mile board speedway. He was born and reared in the vicinity of Los Angeles and belonged to the later-day generation of coast drivers. He finished in ninth place in the recent Indianapolis race

Ruckstell and Pullen Win Two Leading Events—Parsons Wins Intercity for Second Time—Board Speedway Fast

Montamarathon Trophy Race 250 Miles

CAR	DRIVER	TIME	M.P.H.
Mercer	Ruckstell	2:57	84.5
Stutz	Cooper	2:58:5	84.22
Mercer	Pullen	2:58:55	84.20
Peugeot	Burman	3:08:44	79.5
Peugeot	Oldfield	3:17:58	75.8

Golden Potlatch Trophy 200-Mile Race

CAR	DRIVER	TIME	M.P.H.
Mercer	Pullen	2:21:14	85.2
Stutz	Cooper	2:21:25	85
Mercer	Ruckstell	2:31:41	79
Peugeot	Oldfield	2:32:3	78.8

Intercity Trophy Race 100 Miles

CAR	DRIVER	TIME	M.P.H.
Parsons Sp.	Parsons	1:15:27	79.5
Gordon	Elliott	1:20:28	74.7
———	Barsby	1:35:06	63.2
Studebaker	Staley	1:42:30	56.2
Ford Sp.	Erdman	—	—

Three-Race Program

TACOMA, WASH., July 5—The 2-day racing on the newly planked 2-mile speedway evolved three popular winners in the three races held in conjunction with the Montamara festival, Ruckstell, in a Mercer, winning the 250-mile event, at 84.5 m.p.h. or 11.1 m.p.h. faster than the time made by Cooper in the Stutz last year; Pullen, also in a Mercer, capturing the 200-mile race at 85.2 m.p.h., or 11 m.p.h. faster than the time made by Hughes' Maxwell in 1914; and Parsons, in the Parsons special, duplicating his feat of last year, in winning the 100-mile Intercity grind at 79.5 m.p.h., or 5.9 m.p.h. faster than the time he made last year in the Frantz. The main factor in the great increase of average speed was the plank surface of the 2-mile track

which was much more adapted to high speed and less conducive to skidding than the dirt surface over which the races were run last year.

Earl Cooper Second

Second to Ruckstell in the 250-mile Montamarathon Trophy Race, was Earl Cooper, in his Stutz, who finished at an average speed of 84.22 m.p.h. Pullen's Mercer was third at 84.20. Burman was fourth, sending his Peugeot over the course at 79.5 m.p.h., and Oldfield, also in a Peugeot, was fifth at 75.8. Cooper made the fastest of the 129 laps of the race, covering the course at an average speed of 89 m.p.h.

Thirteen cars started in the race, the five mentioned being the only ones to finish. Ruckstell led most of the way by one or two laps and from the 105th circuit was never headed, although the winners were but a few yards apart at the finish. Cooper drove a beautiful race, going to the pits once in the 103d lap and at the finish was driving carefully on worn tires rather than risk a delay at the pits in making a change.

Some Clever Driving

The eight-cylinder Romano ran steadily until the forty-third lap when it took fire and was burned. The Gordon special skidded dangerously three times in the 114th lap on a curve ahead of Cooper, but by wonderful control Elliott managed to slide clear amid the cheers of the 30,000 spectators who braved the heat to watch the speed carnival.

Carlson and Mechanic Killed

Driving on the back stretch on the sixtieth lap Carlson's Maxwell left the course, a tire blowout on a steep curve throwing it over a 30-ft. embankment and Franzen, his mechanician, was thrown onto a stump and his back broken, killing him instantly. Carlson was rushed to the hospital with crushed head and internal injuries, but died this morning without recovering consciousness.

The fate of the other cars was as follows: The Schneider special broke a piston in the seventh lap; the Marmon dropped out in the thirtieth with engine trouble; the Parsons special broke a camshaft in the thirty-third circuit, and the Stutz, driven by Lewis, burned out a bearing in the seventy-eighth, while that of Hill broke its radiator in the ninety-first. The Gordon dropped out in the 117th circuit with engine trouble. The Mercedes failed to report to the committee.

New Record for Intercity

Parsons set a new record for the 100-mile Intercity Trophy Race, covering the fifty-four laps in 1:52:27 or at an average speed of 79.5 m.p.h. Elliott, in a Gordon, was only three laps behind him, averaging 74.7, with Barsby third at 63.2, Staley's Studebaker fourth at 56.2 and Erdman's Ford special, fifth. Parsons took the lead second and was never headed, driving a consistent race without a visit to the pit.

Forbes' Buick dropped out in the tenth lap with engine trouble and the Schneider special was forced to retire in the thirty-first. Thomas' Mercer dropped out in the thirty-ninth with engine trouble followed by O'Brien's Stutz in the next lap for the same cause. The Malcom special left the race in the second lap and engine trouble stopped the career of the Tacoma special in the sixteenth circuit. Stratton's Mercer special had engine trouble and its entry was scratched.

Pullen Wins Potlatch Trophy

Pullen won the 200-mile race for the Golden Potlatch Trophy this afternoon covering the 103 laps of the 2-mile course in 2:21:14, making the highest average for the course, 85.2 m.p.h. The Mercer driver outgeneraled Cooper, in the Stutz, who took second place in 2:21:25 or an average of 85 m.p.h. Ruckstell's Mercer was given third place with a timing of 2:31:41, or an average speed of 79 m.p.h., though this was disputed by Oldfield who was officially placed fourth at 2:32:3 or 78.8 m.p.h. Ruckstell had serious engine trouble in the eighty-ninth lap and spent 8 min. at the pits. This is where the mix-up on the time occurred, Oldfield passing Ruckstell on the ninety-third lap without being properly recorded by the scorers.

Out of twenty-one entries but eight started. The 90-mile-gait Mercers soon forced the race, which resolved itself into a battle between Pullen, Cooper, Ruckstell and Oldfield. Pullen went to the pits in the twenty-first lap but made fast time in getting back in the race again and caught Cooper on the twenty-seventh circuit.

Parsons dropped out in the eighth lap with a broken camshaft and the Marmon withdrew in the twelfth with a broken connecting-rod. A slipping clutch eliminated the Gordon in the sixty-fourth circuit, the lap after Lewis' Stutz was put out by engine trouble. Cooper changed a tire in the sixty-sixth lap, this being his only stop at the pits. Oldfield made one stop in the eighty-fifth lap for a tire change.

Burman did not arrive at the course until the ninetieth lap and was refused admittance to the race by the referee. Other entrants were excused on account of engine troubles.

Weather was ideal with a brisk west wind. The track held up well, the new construction rendering better records possible than those of former years, but the officials were disappointed at the low average speed. Attendance was 15,000.

The cash prizes for the two days' racing totaled $10,500. Those for the 250-mile Montamarathon were $5,500; for the 200-mile Potlatch, $3,500, and for the Intercity Century, $1,500. The races were run under the management of the Tacoma Speedway Assn., Inc., and under the auspices of the Mountainview Automobile Club.

Maxwell Averages 91.74 at Omaha

New 1.25-Mile Speedway Opened

Winners at Omaha Speedway

CAR	DRIVER	TIME	M.P.H.
Maxwell	Rickenbacher	3:17:32.2	91.74
Duesenberg	O'Donnell	3:30:27.7	86.16
Maxwell	Orr	3:40:17.3	82.3

OMAHA, NEB., July 5—*Special Telegram*—Before a crowd of 25,000 spectators, the new 1.25-mile board speedway was opened here by a 300-mile race, which was won by Rickenbacher in a Maxwell at an average of 91.74 m.p.h., a speed which demonstrates satisfactorily the possibilities of small board speedways with high banking and which is a higher average than made at Indianapolis this year. Rickenbacher's victory coming right after his winning of the 300-mile speedway race at Sioux City Saturday, naturally stamped him as one of the serious contenders in future speedway events, to-day's race being his third important victory in a year.

Maxwell-Duesenberg Duel

To-day's race here was in every respect a duplicate of Saturday's race in Sioux City in that Rickenbacher led from start to finish and was pursued throughout the entire distance by O'Donnell in the Duesenberg. O'Donnell's average

was much slower, being 86.16 m.p.h. and who, at the finish, was almost 13 min. back of the leader. Orr landed a second Maxwell in third place, averaging 82.3 m.p.h. The only other cars of the eight starters to finish was the Emden, driven by Donaldson, which averaged 62.39 m.p.h. The Du Chesneau driven by Brown was flagged at the finish. This car did not report on the track until after the leaders had covered 100 miles.

Three cars dropped out during the race; Alley's Duesenberg was eliminated at 10 miles with a burned bearing; Cooper's Sebring went out at 95 miles with a burned bearing; and Chandler's Duesenberg was out at 112 miles with cracked cylinders.

The general consensus of opinion with regard to the 1.25-mile board track highly banked, is that this track is faster than the cars, and few of the drivers cared to climb high on the steep banking in order to pass some of the other cars, the drivers fearing that trouble would come if they blew a tire when high on the bank.

The only real excitement in the race was the brushes between Rickenbacher, O'Donnell and Orr, the race so far as leadership was concerned being a procession for Rickenbacher's Maxwell.

Few Stops by Leaders

Rickenbacher stopped twice during the 300 miles, first at 71 miles to change a tire, and second at 226 miles for supplies. O'Donnell's Duesenberg made four stops, losing in all 4 min. They were: at 35 miles spark plug trouble, at 186 miles for gasoline and oil, at 192 miles for tires, and at 215 miles for spark plug trouble. Orr, who finished third, had three stops with his Maxwell, 26 miles mechanical trouble, 105 miles tires, and 272 miles for fuel.

The day was exceedingly hot and the track was feared to some extent. The drivers expected trouble on the high-banked turns. Between 150 and 200 miles O'Donnell slid down the bank for some unknown reason and almost turned his car over when it hit the soft dirt at the bottom. He was delayed only a few seconds. In order to pass a car driving in the center of the track on the turns it was necessary to travel close to 100 m.p.h. Rickenbacher was not pushed and when he had a four-lap lead was flagged and drove easily to the finish.

Rickenbacher started into the lead at 12:40 when Starter Fred J. Wagner sent the cars away. During the first 25 miles there was a merry chase between Rickenbacher, O'Donnell, Chandler and Orr and at one time it looked as if Chandler might take the lead and hold it. The Maxwell was too fast and the driver too daring and at 25 miles the order above was maintained, the average speed being 98, time 15 minutes 18 seconds.

Maxwell Gets in Lead

O'Donnell stopped at 40 miles and Chandler at 42, which gave Rickenbacher a lead of four laps of the 1.25-mile board track. He still led at 50 miles, time 30 min. 46 sec. With this lead he slowed down during the next 25 miles and at 75 led with an average of 97.5.

Maxwell Takes Century Money

O'Donnell and Rickenbacher made things interesting at this time, each trying hard to lead at 100 miles to capture the $250 prize offered. Rickenbacher succeeded in 1:05:28, an average of 91.65 m.p.h.

The order at 100 miles was Rickenbacher, O'Donnell, Orr, J. Cooper, Donaldson, Chandler and W. Brown, who had just come on the track. The same order maintained up to 200 miles except Cooper dropped out. Rickenbacher took another $250 for leading at 200 miles; time 2 hr., 10 min., 44 sec., average 91.79. At this stage Rickenbacher was ten laps ahead of O'Donnell, who stopped at 190 miles for a tire.

The order at 200 and 250 miles was the same as at 100; except that Chandler was out after having worked on his car for 1 hr. replacing a burned connecting-rod bearing. Time for the 200 miles was 2 hr., 44 min., 52 sec., the average speed being 90.98 m.p.h. The same order was maintained at the finish with Rickenbacher about ten laps ahead of O'Donnell.

Cord Tires Lead

Rickenbacher's Maxwell used the same equipment at Sioux City on Saturday, excepting Silvertown cord tires. O'Donnell's Duesenberg also changed to Silvertown cords and used Rajah plugs. Orr's Maxwell's equipment differed from Sioux City in that it used Silvertown cords and Zenith carbureter. The other cars used practically the same equipment as at Sioux City excepting Silvertown on all but the Du Chesneau. The cord tires gave a good account of themselves to-day, only four being changed during the race, these being by Rickenbacher, O'Donnell, Orr and Donaldson.

New Magneto Industry Started in France

(*Continued from page* 52)

which was largely responsible for the great increase in electric lighting and starting sets on French cars at the 1912 Paris show.

Thirty Automobile Firms Unite

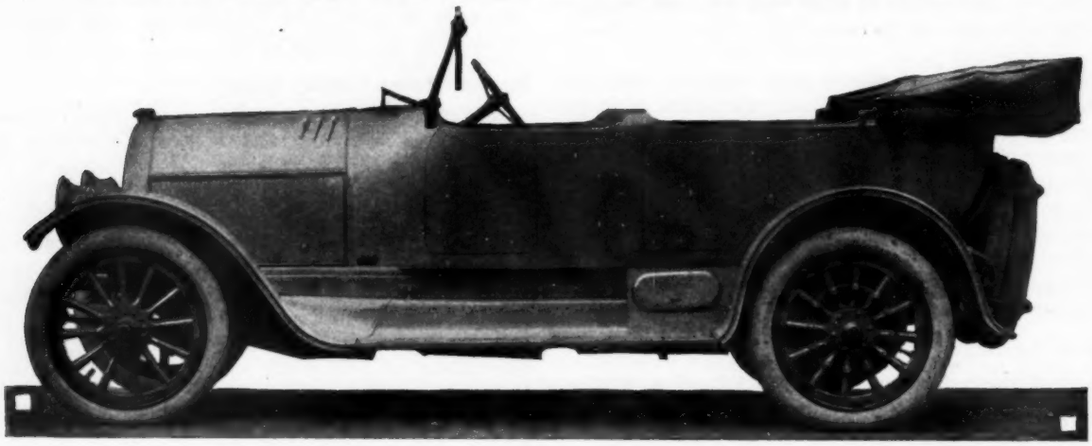
From $160,000 the capital of this company was increased to $400,000 as soon as it was decided to build magnetos on a big scale. A circular was sent to every automobile manufacturer in France, every aeroplane maker, every gas engine builder, setting forth the intention of the S. E. V. company to take up magneto construction, and inviting those firms to take up stock. It was sought to bring into this magneto company every automobile interest. The result is that instead of the nine firms originally interested in the S. E. V. company, there are more than thirty of the leading automobile manufacturers in the enlarged concern, and their combined car output is equal to three-quarters of the total of the French industry.

When the war broke out the S. E. V. company had begun the construction of a big four-story factory at Issy-les-Moulineaux, on the suburbs of Paris. All ordinary building activities had been stopped and will remain suspended until after the war. The building was finished in shorter time than under normal conditions. Machinery has been obtained from America and England and has been installed. The new factory began the work of producing S. E. V. magnetos the middle of May. With the opening of that factory France became independent of outside sources for her supply of magnetos.

As soon as peace has been signed, all German factories in France will pass into the hands of their original owners, with, in such cases as the Bosch company, a rental for their use. The German firms will be free to do business. "So far as our firm is concerned," declared the head of one of the leading French automobile factories in conversation with the writer, "we are through with German supplies." If they were questioned, such firms as Renault, Panhard, Delaunay-Belleville, Mors, Peugeot, Delahaye, Darracq, Bayard-Clement Charron, De Dion Bouton, and a score of others would make the same reply. French manufacturers are determined that the commercial war against Germany shall be as relentless as the war waged with fire and sword.

1916 Fiat Bodies of Distinctive Design

Riviera Is a Combination Five-Passenger Phaeton and Seven-Passenger Touring Car—Few Chassis Changes



The Riviera model 1916 Fiat which is mounted on either the four or six-cylinder chassis

BUT two detail changes have been made in the Fiat chassis built by the Fiat Automobile Co., Poughkeepsie, N. Y., with the introduction of the new model known as the Riviera. The body design, however, is entirely new and is a combination five-passenger phaeton and seven-passenger touring car, of modified streamline and modified double cowl. The two chassis changes are minor ones, being simply a sliding block in the universal at the forward end of the shaft which compensates for longitudinal motion of the rear axle and drive units and the front ball and socket steering connection.

Materials Carefully Selected

It is in the selection of materials that the Fiat is distinctive. One of the points which stands out above all others is in the use of hardened steel bushings against hardened steel pins, at places where only medium heavy duty is required. This applies to such parts as the valve guides, steering connections, etc. Chrome-nickel steel is used in nearly all the important forgings throughout the entire car, examples being the crankshaft, steering parts, gearset parts, and in fact all forgings which have to bear any stress of importance. The valve construction is another example of the careful use of materials being a built-up design with a nickel-steel head, carbon steel stem and a cast-iron seating ring.

Two standard models are manufactered known as type 55, four-cylinder, and 56, six-cylinder. These are identical in every respect with the exception of the motors. The four-cylinder model was added in 1912 and has been continued ever since with only the minor refinements noted. The cylinder dimensions of the four are 5.125 by 6.75 and of the six they are 4.4 by 5.9. Both have block castings and the leading feature of each is the simplicity with which the details of construction have been worked out. Referring to the transverse section, of the four-cylinder motor, illustrated herewith, it will be noted that, although block-cast, considerable waterjacket space has been allowed all around the cylinder castings.

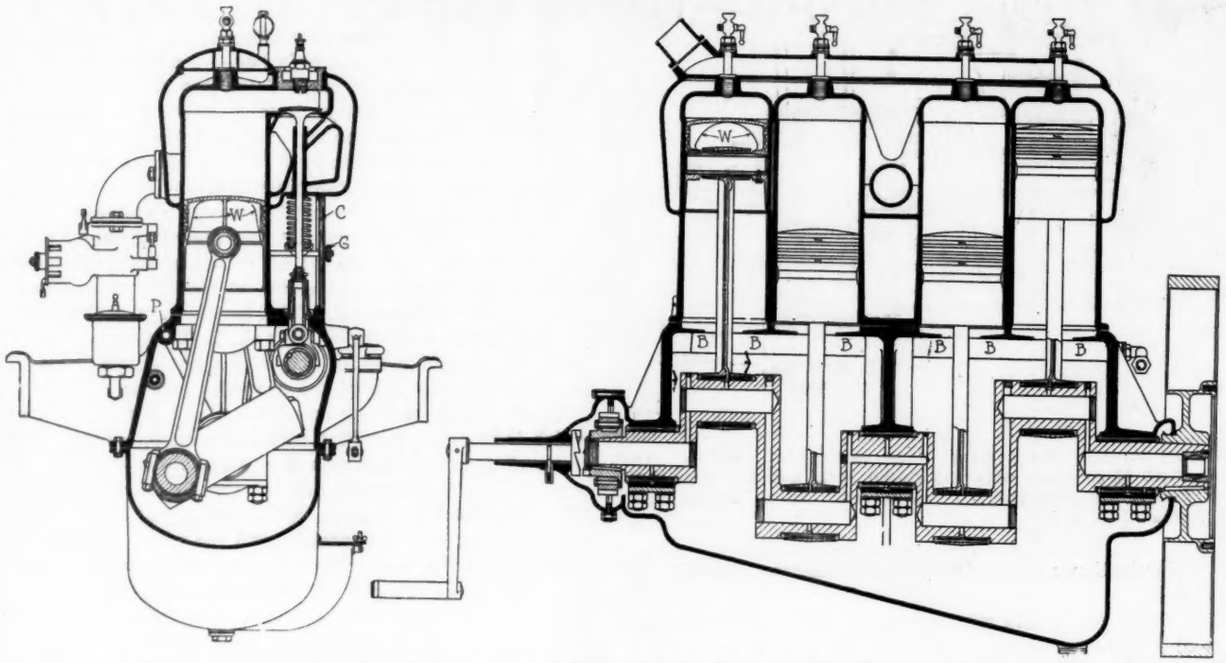
The pistons have four rings at the top and are slightly convex in shape. They are double-webbed across the head as shown at W in the transverse and longitudinal motor sections. The bearing for the piston is formed by a bushing in the upper end of the connecting-rod and this is an interesting point of where steel against steel is used. Naturally, the question of lubrication is of prime importance to avoid any tendency of seizing, and this has been specially guarded against as will be pointed out. The connecting-rods are drop-forged I-beams and the crankshaft in the four-cylinder model is carried on three main bearings. On the six, the crankshaft has four babbitt-lined main bearings.

Actuating the valves, there is a camshaft which has the cams keyed and pinned to it operating directly on a roller follower on the pushrod. This is carried within a steel bushing above which is the adjustment point for allowing clearance below the valve stem. The valve action is covered as shown at C by a substantial plate removable by the knurled nut G. A feature of the valve is that the angle of the seat is 30 degrees in place of the conventional 45, this being done to give a quicker and wider opening, for the same amount of lift.

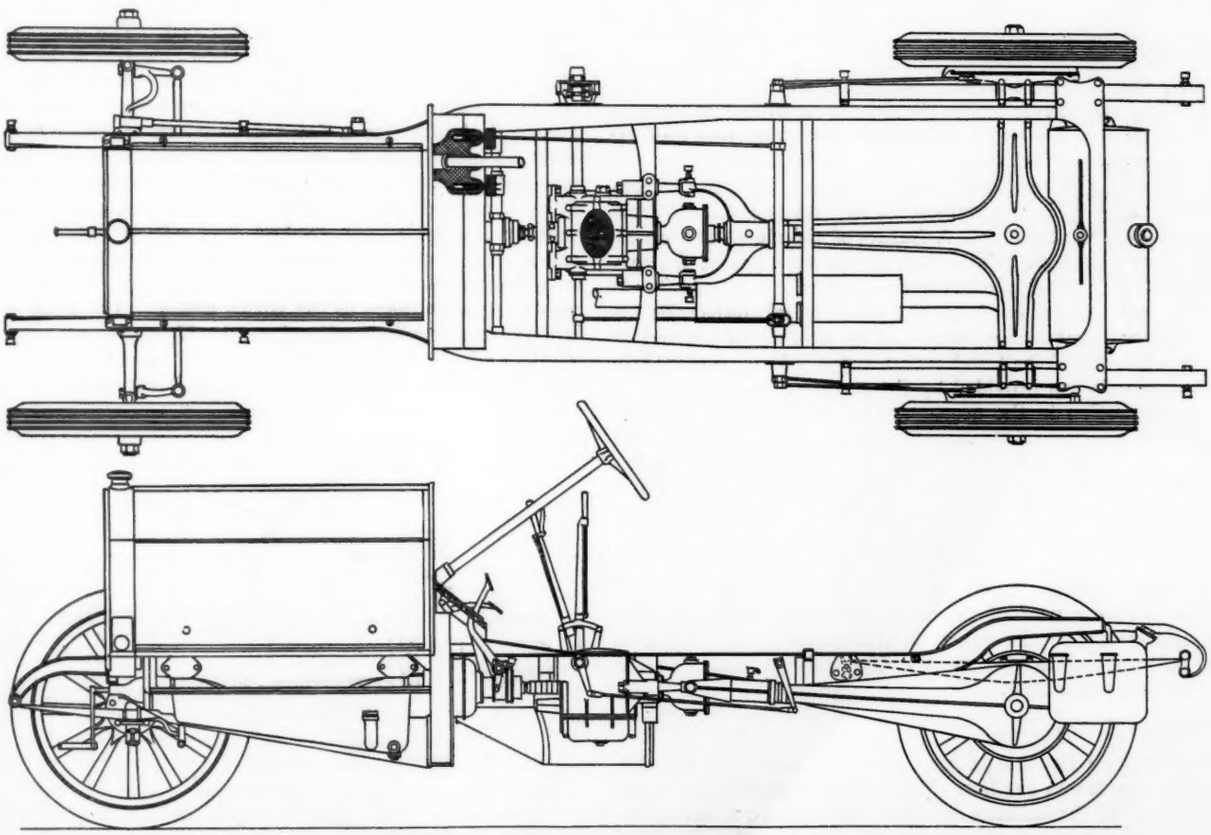
Force-Feed Oiling System

As would be expected with the use of many steel-against-steel parts, the lubrication is force-feed non-splash. The crankshaft is a hollow design both for lightness and to facilitate the pumping of oil through the center. The oil pump is a gear design operated from the rear end of the crankshaft carrying the oil from the reservoir in the bottom of the crank case to a horizontal copper pipe in the case itself. This horizontal pipe extends from one end of the case to the other and is shown in the sectional view at P. From the pipe are leads to each of the main bearings of the motor. The oil passes around the main bearings and entering the hollow crankshaft is forced along its entire length until it reaches the cranks, the cheeks of which are drilled, allowing a passage for the oil to the hollow crankpins. Here the oil under pressure reaches the lower connecting-rod bearings and in addition is forced upwards along a tube to the wristpin bearings which are oiled copiously as required by the steel pins against the steel bushings at this point. An interesting feature is the use of integral baffle plates B which prevent an excess of oil being thrown into the cylinders, thereby caus-

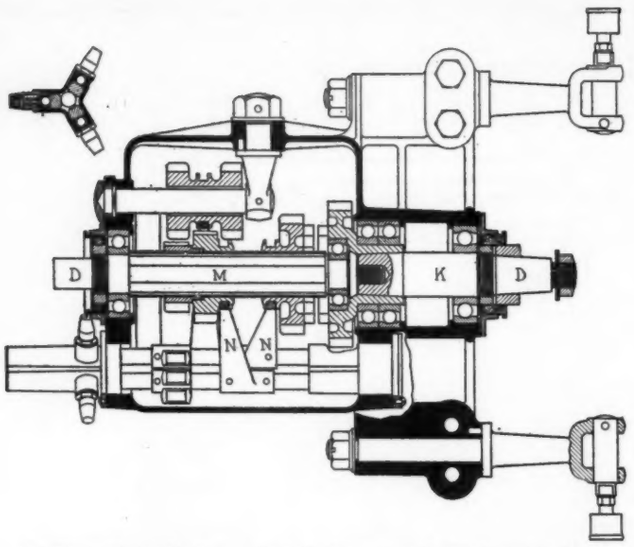
Some Details of 1916 Fiat Chassis



Side and end sections through the four-cylinder Fiat motor for 1916, showing the use of four piston rings as indicated at W. The valve action is covered as shown at C, the plate being removable by the knurled nut G. P is the horizontal oil lead and in the side section B indicates integral baffle plates preventing excess oil being thrown into the cylinders and thereby causing carbonization and smoke



Plan and elevation of 1916 Fiat chassis, showing characteristic rear axle housing and torque tube construction together with the yoke and universal construction at the forward end of the propeller shaft. Detail of this yoke and the section through the gearbox appear on the following page.



Section through the compact four speed Fiat gearset. The main shaft M connects with the clutch at D and the stub shaft K transmits the drive through the universal joint. Shifter forks are indicated at N

ing carbonization and smoke. The crankcase capacity is 5 gallons.

The water pump and magneto are driven off the opposite ends of a transverse shaft located at the forward end of the motor. The driving shaft for the two units is carried on ball bearings and is driven through spiral gears with teeth at 45 degrees. The entire drive of this shaft is inclosed and runs in a bath of lubricating oil. Flexible couplings are used in the drive.

Sixty-five-Disk Clutch

Sixty-five disks are used in the clutch, thirty-three driving and thirty-two driven. The single clutch spring introduces the pressure on the large amount of bearing surface and the whole engagement runs in oil and is contained in an oil-proof housing. There is a packing box surrounding the centrally located spring container which prevents the oil from leaking from the housing. A feature of the clutch is the provision for alignment by allowing the forward end of the carrier shaft to extend into the rear end of the crankshaft. It is there supported upon a bushing of spherical shape which is held by another bushing supported on threads in the end of the crankshaft. A ball and socket support is thus provided.

Four speeds are provided by the compact gearset which is shown in section in the accompanying illustration. The design is distinctive as the mainshaft M which connects with the clutch at the extremity D extends the length of the gearbox proper, being carried on ball bearings at either end. The stubshaft K at the rear end of the gearbox connects with the universal joint and thence transmits the drive through the propeller shaft. Chrome-nickel steel gears and shafts are used and altogether there are seven rows of ball bearings. A double row is used at the inner end of the short shaft K through which all the power is transmitted. The shaft is four-splined and carries upon it the sliding units actuated by the shifter forks N.

Distinctive Torque Tube

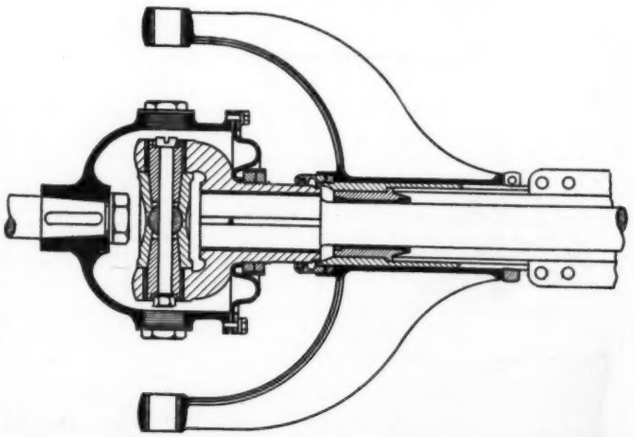
The housing for the gearset is in two parts and is made from an aluminum casting. The mainshaft is carried in the upper half of the housing and the bearings are mounted between the two parts at their junction. The top of the gearbox forms a large cover plate and all connections are milled to form a close juncture and thus prevent oil leaks. Packing boxes are located at the inner end of the main shaft M and at the rear end of the short shaft K. A heavy horizontal web is formed in the gearbox and in this are mounted the trunnion supports for carrying the forked yoke at the forward end of the propulsion tube which surrounds the propeller shaft.

The Fiat rear system is distinctive in the employment of a solid pressed steel rear axle housing and torque tube combined. The housing is made from two stampings manufactured at the Turin, Italy, factory of the Fiat organization. One stamping forms the top half and the other the bottom, and the weight of the two is close to 80 pounds combined. The material used in the stamping is a .50 carbon manganese steel, 4 millimeters or about 1-6-inch in thickness. The two halves are bolted together through their flanges by 5-16-inch cold rolled steel bolts placed 4.5 inches apart on the straight parts of the housing and closer at the curved portions surrounding the differential. The bevel drive differential and the axle shaft are caried on 4 R. I. V. annular ball bearings, and a double set of these bearings support the pinion fitted to the rear end of the propeller shaft.

The ball type steering knuckle and spindle is a refinement which is found in the Fiat cars and although it has been incorporated in both models for some time was not in the original model first put out by the Poughkeepsie concern. The wheels toe in and are so arranged that the center lines through the spindle connection and the wheel intersect at the point where the tire rests upon the ground. The ball and socket joints at the end of the tie rods also aid in providing easy steering and at the same time the car weight is carried on a ball thrust bearing beneath the upper jaw of the knuckle. These parts are lubricated by grease cups and of a design which gives great durability.

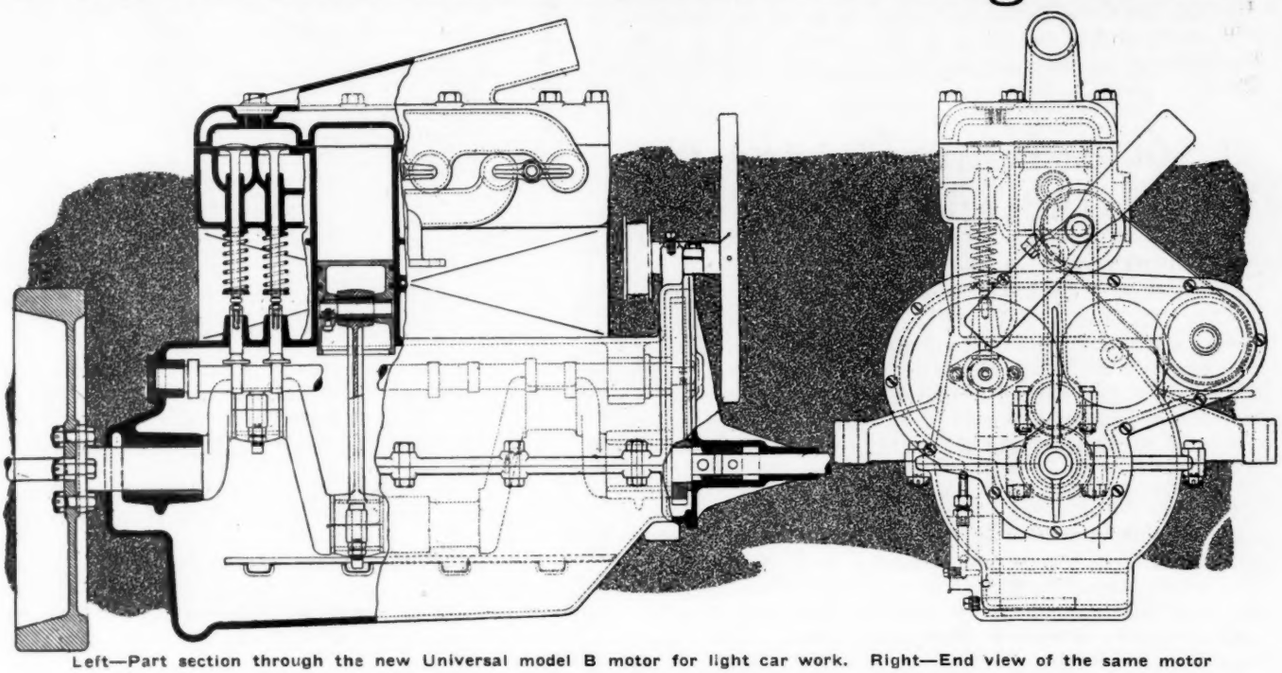
116-Inch Wheelbase

The wheelbases of both the four and six are the same, being 116 inches with standard 56-inch tread. The equipment is complete including Bosch lubrication, electric lighting and starting and a full line of accessories including speedometer, clock, demountable rims, etc. The new body as fitted to the standard chassis has a front door width of 19 inches, rear door, 22 inches, width between tufting at the front seats 43 inches and width of rear seat between tufting of 46 inches. It is a molded design with no abrupt interruption of the contour but made in a gradual sweep from radiator to the end of cowl thence to the secondary cowl sweeping back to the rear end of the tonneau with a gradual slope which lends a low, long appearance to the entire design. The price of the Riviera model fully equipped on the 55 or four-cylinder car is $4,850 f.o.b. Poughkeepsie. On the type 56, six-cylinder chassis, the price is $5,350 f.o.b. Poughkeepsie.



Details of fork yoke and universal at the forward end of the propulsion tube which surrounds the propeller shaft on the 1916 Fiat

Two Universal Motors for Light Cars



Left—Part section through the new Universal model B motor for light car work. Right—End view of the same motor

Model A is 2.5 by 3.5 Inches and Model B 2.625 by 4 —Similar in General Design

TWO motors specially designed for light car work have been brought out by the Universal Motor Co., Oshkosh, Wis. These are known as models A and B and are 2.5 by 3.5 and 2.625 by 4 inches, respectively. The two models are along very similar lines, except for their capacities. Owing to this, the smaller motor is generally used in connection with a 5 to 1 rear axle ratio, whereas the model B takes a 4 to 1. This would give a speed in r.p.m. of 2,400 for the model A at 40 miles per hour with a 5 to 1 ratio. The S. A. E. ratings are respectively 10 and 11 horsepower.

In general design, these motors are four-cylinder, four-cycle, block cast assemblies with three-point suspension. The cylinder heads are removable and carry the water header in a unit. Considering the model B motor, the pistons are a flat head type, fitted with a leak-proof ring and two 3-16-inch rings at the top. The piston pin is case-hardened and the connecting-rod is an I-beam 7.375 inches center-to-center length. The connecting-rod is bushed at the piston end and the pin is secured to the piston boss by a set screw.

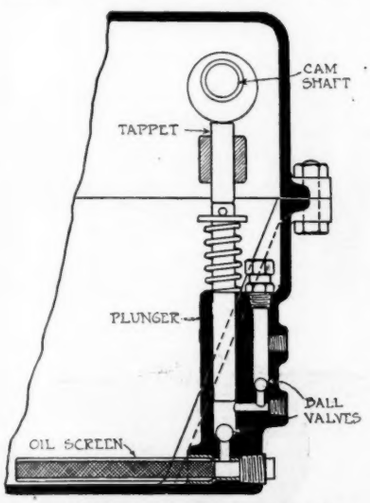
Some Dimensions

The crankshaft is 1.5 inches in diameter forged from medium carbon steel. The crank bearings as well as the main crankshaft bearings are lined with die-cast bearing metal. The crankpins are 1.5 inches in diameter and 1.75 inches in length. The main bearings, of which there are two, are 1.5 inches in diameter and 2.5 inches in length. The camshaft is a one-piece drop-forging with the cams integral and the valves are operated through mushroom valve plungers. The valve diameter is such as to give a 1.125-inch clear opening. The valves have a steel stem with cast-iron head.

Features of the design of both motors are the same, but the dimensions vary. In the smaller motor, the crankshaft is 1.25 inches in diameter, although of the same material as in the larger design. The crankpin diameter is 1.25 inch with a 1.5-inch point and the bearings are 1.25 by 2.375 inches.

Vertical Oil Pump

One of the features of the Universal motors is the vertical oil pump which has the plunger extending downward into the crankcase oil reservoir so deeply that there is no chance of its losing suction. This detail provides a safety feature as the pump need never be primed. All the Universal motors are supplied with a Mayer carbureter and Berling magneto.



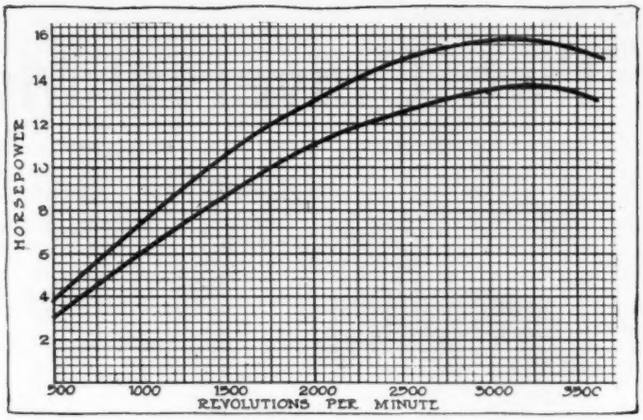
Vertical oil pump on Universal motors which never requires priming

Characteristics Similar.

As shown by the horsepower curves of the models A and B motors, these have about the same characteristics. The peaks of the curve being at 3,000 r.p.m. or more, showing that these are distinctly of high-speed design. The horsepower increase up to 2,500 r.p.m. is quite rapid and the S. A. E. horsepower developed by the model A is about 1,750 r.p.m. while that of model B is about 1,550 r.p.m.

The aim of the designers of these motors has evidently been to follow along the latest lines of high-speed, high-efficiency design. The parts throughout are of light

weight and the curves show a high rotary speed before reaching the peaks. The motors are distinctly designed to serve the needs of the cars for which they are intended, that is, cars of light weight weight and high nominal speed capacity. It is a type of design which should give good fuel economy, provided that the reduction gearing in the power transmission is properly worked out, allowing the motors to work at their best efficiency at what may be called the cruising or touring speeds.



Horsepower curves of model A and model B Universal motors

1,500-Pounder Added to Indiana Line

SPECIFICATIONS of the Indiana 1.500-pound worm-driven truck have been announced by the Harwood-Barley Mfg. Co., Marion, Ind. This truck is largely built in the factory of the Indiana concern, and it includes such features as a block motor, unit power plant, three-speed gearbox and worm drive. The worm-driven rear axle is assembled in the shop of the manufacturer and the Rutenber Motor Co. builds a special power plant for this chassis under the name of Model 20.

Three-Point Suspension

Three-point suspension is used for the 3.5 by 5-inch unit power plant, which is located under the hood. The motor is an L-head design with the valves on the left side. Standard design is used throughout the motor, cooling being by centrifugal pump through a finned tube radiator. The carbureter is a Schebler, ignition is by high-tension magneto and lubrication by pressure feed through the main bearings, camshaft and connecting-rod bearings. Splash is also employed for the cylinders and other internal motor parts. Power is transmitted through a multiple disk, dry plate clutch, to a three-speed sliding selective gearbox with shafts mounted on ball bearings. The face width of the gears and the gearset is .875 inch and the gears are of heat treated nickel steel of high tensile strength.

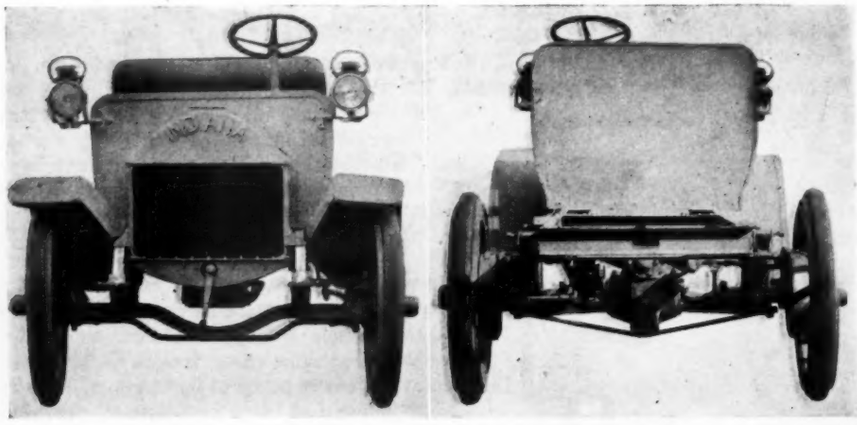
From the gearset, the drive passes through a shaft of alloy steel to the floating rear axle with its worm drive. The worm has a 2.75-inch outside diameter and the gear 2.625 inches outside diameter. The face width of the gear is 2.25 inches. The worm is mounted on S. K. F. imported annular and thrust bearings. The gear is mounted on New Departure ball bearings. A generous use of alloy steel is made in the drive members, the live shaft of the axle being 1 and 9-16 inches in diameter and of chrome-nickel steel. The housing is a steel casting and the inside diameter of the axle is 2 5-16 inches. The type of worm gear is that known as the Cleveland.

Artillery wheels 36 inches in diameter are employed. Both front and rear wheels have fourteen 1.75-inch spokes. The tires are solid 36 by 3.5 front and 36 by 4 rear. The drive is taken through a torque rod and through alloy steel springs. The front axle is a 2.5 by 1.5-inch I-beam with the spring pads integral. The chain is a channel, 4 inches in depth, weighing 5.25 pounds per running foot. It has three cross members reinforced with gusset plates.

Large Loading Space

A long wheelbase providing great loading space is given on this truck. The wheelbase is 130 inches and the loading space back of the seat is 93 inches long. The tread is a little wider than normal, being 58 inches. Full equipment is sold with the truck, a governor being fitted to limit the motor speed to 1,200 r.p.m. which corresponds to a truck speed of 25 miles per hour on high gear. The gasoline tank is located under the driver's seat and control is central with left drive steering being effected by a Lavigne gear. The price of the chassis is $1,200 and its rated capacity 1,500 to 2,000 pounds.

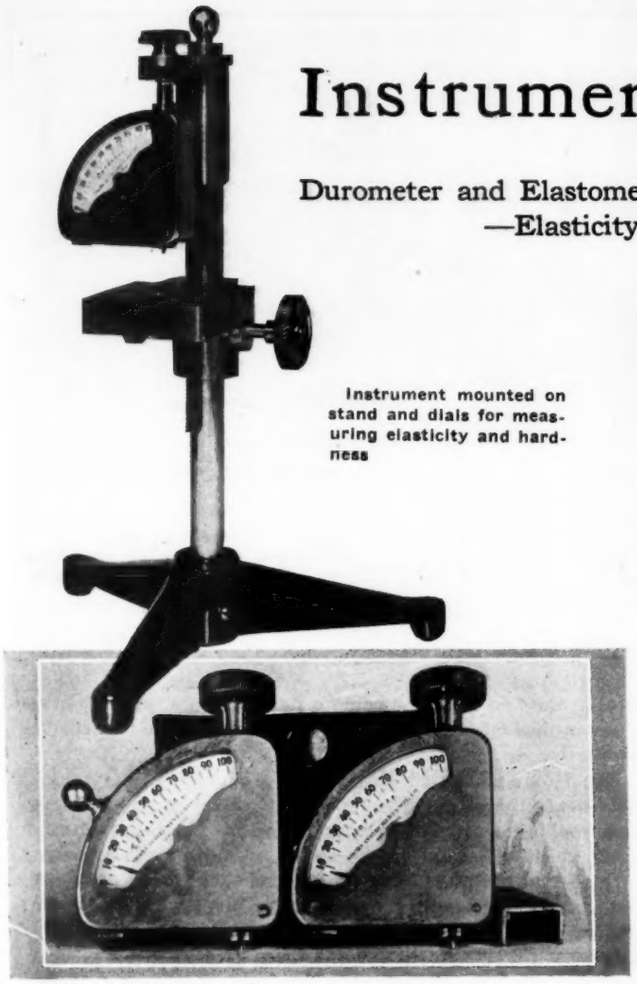
Throughout the entire design, the needs of the average service required by a 1,500-pound wagon have been kept in mind. The vehicle is especially suitable for the carrying of a large number of small packages of different bulks, and to fill any purpose.



Above—Front and rear views of the Indiana 1,500-pound left-drive truck chassis. Right—Side view, showing simple, sturdy construction and large loading space

Instruments to Test Rubber

Durometer and Elastometer Measure Relative Hardness and Elasticity —Elasticity Decreases as Hardness Increases



Instrument mounted on stand and dials for measuring elasticity and hardness

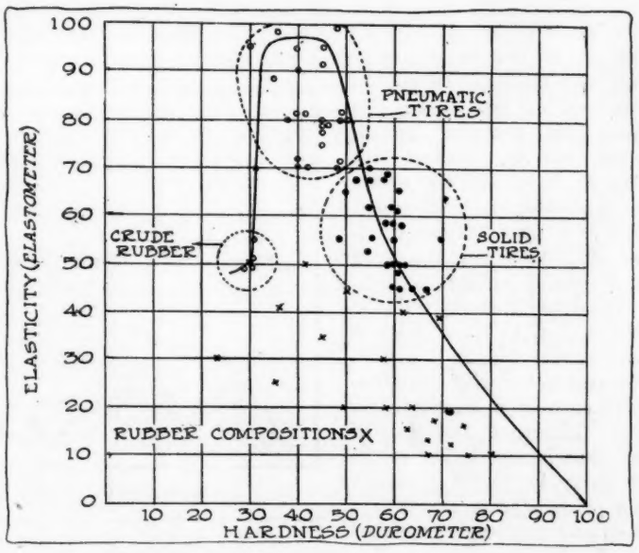
AN interesting example of the manner in which the methods of making tests on metals are spreading to other materials and industries, is that in which types of hardness machines have been adapted for rubber under the names of the durometer and elastometer. These instruments brought out by the Shore Instrument & Mfg. Co. of New York City measure the hardness of rubber in terms of resistance to depression of a plain surface by a standard spring pressing on a blunt pin; and the elasticity in terms of resistance to permanent deformation or tearing. The tests and the difference between them are clearly illustrated at the bottom of this page at *A* and *B*. At *A* the piece is undergoing the test for hardness and as will be noted the material is not torn by the pin. At *B* the test for elasticity is being made and it will be seen the pin enters the material for a considerable distance, effecting a permanent deformation.

The relation of the edge of the point and the depth it has been caused to penetrate has been carefully determined by experiments on extremely elastic rubber. If the latter is quite perfect, no tearing or permanent injury results and the point will be ejected after unlocking it. The extent of the rubber's recovery after imposing this severe stress will then indicate such percentage of elasticity as will correspond with the older form of stretch test. The new test has the advantage of being applicable to the plain surface of finished articles and practically leaves no visible mark.

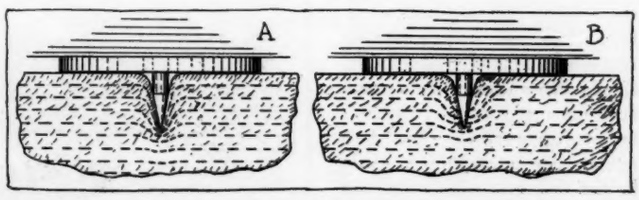
The elastometer is designed for free-hand usage and is put up in a leather pocket case. The durometer is best suited, however, for a stand as shown herewith. The instruments are used principally by manufacturers of rubber, and buyers who desire to test their product. A chart showing the results of test of these instruments and giving comparative data, bringing out the relations between the hardness and elasticity tests, is shown herewith. The importance of the measurement of the hardness and elasticity of the rubber can be well realized when it is noted that when so vulcanized that the maximum elasticity is reached, and when the hardness is yet too low for most purposes, each degree of hardness gained is done so at a sacrifice of about 3 deg. of elasticity. This is clearly brought out in the chart and so persistent is this loss of elasticity that when, for example, solid tires are hardened enough to carry the maximum loads, often so much elasticity is lost that but very little efficiency can be expected.

In the manufacture of rubber goods the process is not under such close control as is the control of metal, for instance, at the present time; but only a few years ago the treatment of metals was very much in the stage that the treatment of rubber is in at the present time. With the ever increasing demand for uniform material, it is aimed to standardize the physical properties of rubber as used in tires.

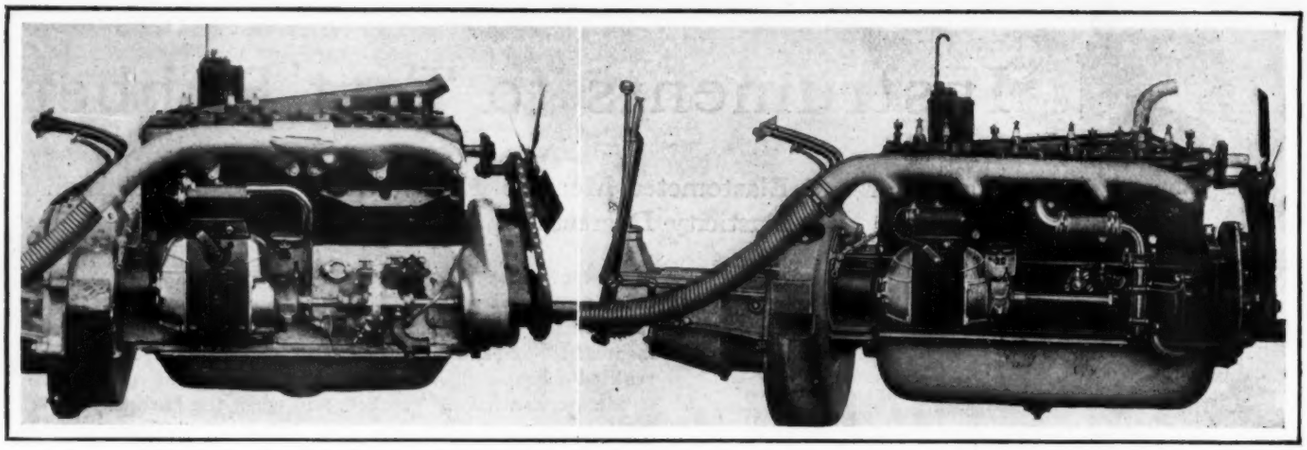
In rubber working a pure raw material does not guarantee the finest finished mattrial when subjected to a given heat treatment. Obviously then, when a fine article is produced, it is not possible to tell without destroying it just what the physical properties are which favor a given result, thus leaving the manufacturer more or less unenlightened.



Curve showing the relation between the elasticity and hardness of rubber



The test for hardness and elasticity, hardness at A and elasticity at B



Two Continental motors used in the Moon six-thirty and six-forty for 1916 showing starter mountings

Two Moon Sixes for 1916—One New

Larger Model Refined and Continued

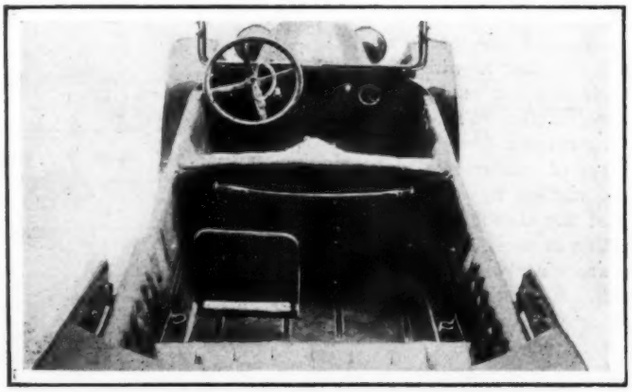
TWO sixes will make up the Moon line for 1916. One, known as the six-forty, is a continuation from last season with a number of refinements and a price reduction of $125. The other known as the six-thirty, is an entirely new model somewhat smaller than the six-forty.

The new features on the Moon model six-forty include a longer wheelbase, that dimension now being 125 inches instead of 123, a new body with the popular tumble-home design which is 2 in. wider across the rear seat and has 1 in. more leg room and 1 in. more tonneau room. These increases in space take up the 2-in. difference in wheelbase. The rear springs are longer and a new Delco starter with ammeter and combination switch on the dash has been fitted. The rear axle now has spiral-bevel drive instead of straight bevel and the equipment is improved by the addition of a motor-driven horn, non-skid tires on the rear and Spanish leather.

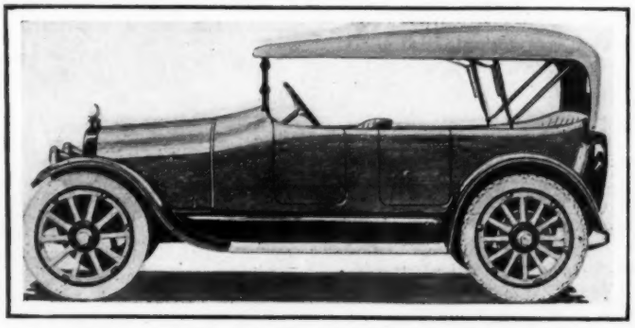
The new six-thirty sells for $1,195 and is fitted with a six-cylinder 3¼ by 4½ Continental motor with the cylinders cast in a single block. The important features of the chassis are similar to the six-forty in design although the price of this car is less than any previously produced by the Moon company. This new model is mounted on a 118-in. wheelbase, is equipped with Delco lighting and starting, has a five-passenger tumble-home body, 33 by 4 in. tires, Hotchkiss drive and full-floating axle. In exterior appearance the two models are quite similar, this being brought about by the fact that the fenders, hood, windshield and tank are identical in the two cars, one being a five-passenger and the other a seven-passenger with the relative power and dimensions proportioned.

The motor in the six-thirty differs slightly from previous Continental practice. The top half of the cylinders is removable, making a detachable cylinder head. The Delco starting outfit is built directly on the motor giving a rigid mounting for this unit and the bell housing for the clutch is a unit with the crankcase, giving a compact power plant with three-point suspension. The clutch is a dry-plate disk, the gearset a three-speed nickel-steel gear design carried on annular bearings and the rear axles floating on annular bearings carried in a pressed steel housing.

The six-forty which has been considerably modified in detail has also the Continental motor employed for 1915, its dimensions being 3½ by 5 and being fitted with Delco starting, Rayfield carbureter, Stewart vacuum feed and unit power plant crankcase with bell housing integral. Both the crankshaft and camshaft in these motors have three bearings, these bearings being contained in the upper part of the crankcase, while the lower part of the crankcase is sealed by a pressed steel oil pan. The 15-in. flywheel bolts solidly to a flange on the crankshaft. The Delco combination, ignition, starting and lighting unit is mounted on the right side of the motor and the makers claim that the starter cranks the motor at 125 r.p.m. The entire electrical system is operated at 6 volts and the battery is carried on a frame under the floor board.



Disappearing seats used in Moon seven-passenger



Moon tumble-home body adopted for 1916 season

Trends in Touring Body Designs

Three Typical Designs on Different Wheelbases Illustrated—Other Necessary Body Details

By George J. Mercer

THE touring body still retains its place as the most popular of body types for general purposes, it is used in larger quantities than other models because it comes nearer meeting all the requirements of an every-man's car and when made in quantities it can be produced at a moderate price and yet have the smart appearance of the to-order body.

The criticism of the open body is that it does not afford the protection from dust that the all-weather or closed body does, especially is this true of the occupants of the rear seat, who are subjected to the dust raised by the air currents or eddies set in motion by the irregular body side lines. The general adoption of the flush-side, streamline, torpedo body has minimized this trouble and the top serves as a shield both in its up and down positions.

Developing the Body

The name touring body is now applied in this country to the torpedo model, the older form of touring model has entirely disappeared, it survived for a time in a modified form by having the fore doors added, but is now seldom seen. The progressive steps in body development have been accompanied by very material changes in the car itself: The engine hoods are now part of the body line; the running boards and frame are lower; the dash lamps have nearly disappeared; the radiator lines have been modified; the running board shield has a blended surface from the board to the body line, the guards have easy lines and the removal of the gasoline tank from under the front seat, permits of the seat cushions being placed nearer the floor, and left drive with center control affords a better line from the body width to the hood.

The body has been amplified also by better windshields, many of which are slanted back to overcome wind pressure; the tops are mostly the one-man type, that do not require supporting irons on the front seat. The attachment for holding down the top have been improved as well as the place for attaching the side curtains. During the past year, there has been placed on the market, a method of inclosing the body for winter use with removable side windows that can be attached to any car, making it nearly as comfortable as a closed body.

The public interest in style is in the present and near-future modes and the three illustrations herewith, illustrate the most modern of the conventional types, the illustrations show three bodies of different size and design and on chassis of different length of wheelbase. Two of the controlling features in a body design are the capacity required in the body and the space provided on the chassis. Of the various dimensions required to show the chassis space, the most important is that from the back of the dash to the center of the rear wheel. The wheelbase of a car is misleading when applied with reference to body space, because two cars may have the same wheelbase, and if one is a six-cylinder and the other a four, the engine hood of one will be longer than the other and consequently the front wheel of one will be further forward of the dash not less than 6 in. than the other, and the body space of a six will be 6 in. or more inches shorter than a four and yet have the same wheelbase. This is indicated on the designs.

These illustrations serve both to show the design and to carry the dimensions in figures of the most essential sizes on all views, and all three designs have the up-to-date feature of having the top line of the seat inconspicuous. The seat cushions are closer to the floor than formerly, and to have the proper height for the seat back and still maintain the low-looking body, the cushions are tilted toward the rear so that the sitting position is partly a reclining one.

Three Typical Designs

The three designs are shown respectively on chassis with 122-, 132- and 142-in. wheelbases and the seating capacity is for four passengers on one, five on the second and six on the third.

One design has central doors, one has staggered doors and the large body has four doors.

Fig. 1 is the four-passenger body, 122-in. wheelbase chassis, having 32-in. wheels and the gasoline tank placed under the cowl. There are two doors that are placed centrally, one on each side, and the passage to the front seats is by the aisle between them. The front seat is built in from the body side top line and this line is unbroken from the cowl to the rear, terminating in the graduated upward back seat line.

The top edge of the body is rounded over from the outside with about 1-in. radius and the metal panel is fastened to the inner edge of the wood framing, the joining being covered by the trimming, which latter does not appear noticeably above the body line.

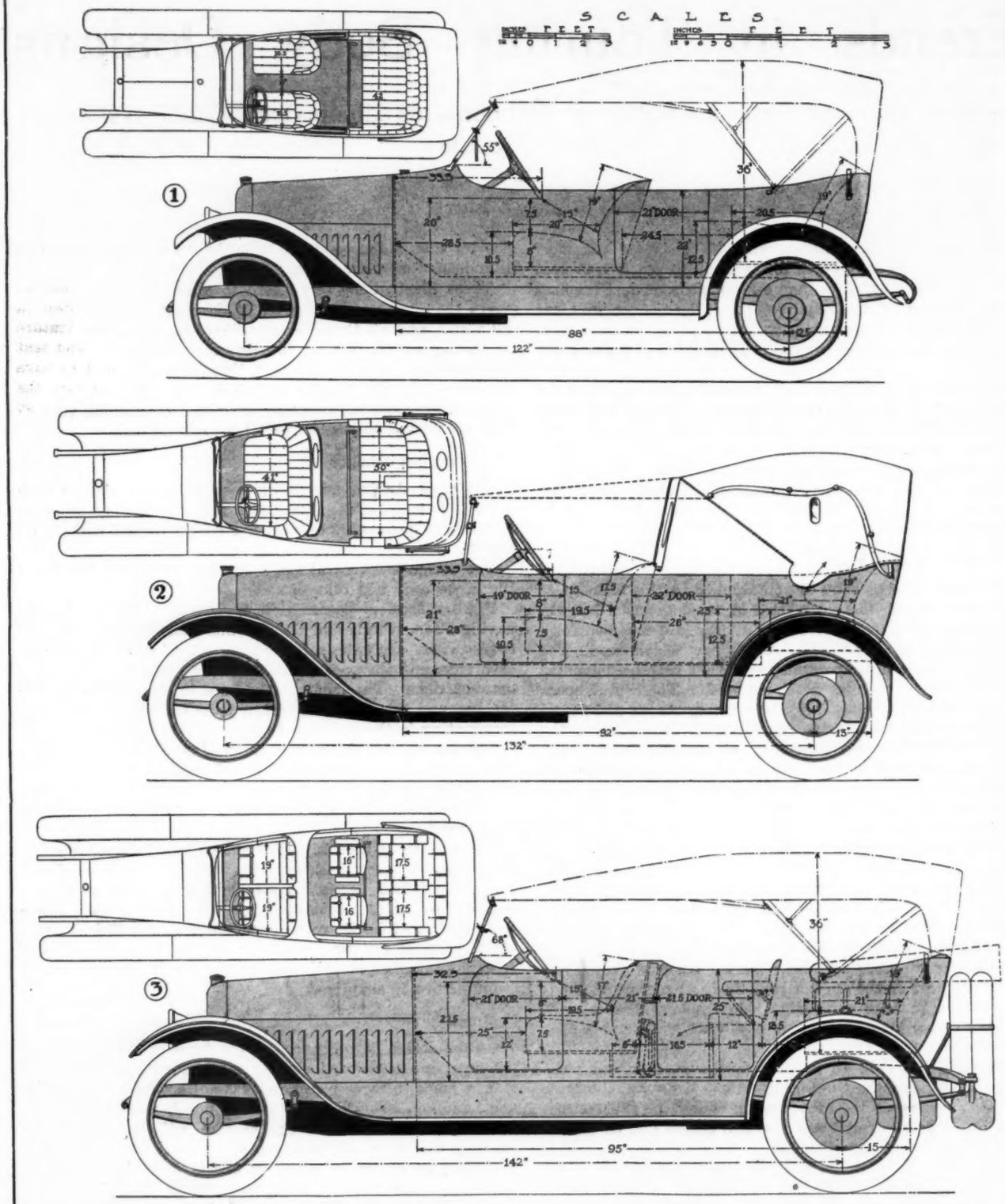
The making of the body shell has become increasingly difficult for the custom builder as the styles have advanced and the accomplished, successful acetylene welding of aluminum panels has come at a time when it is very much needed, where the quantity of bodies to be produced are of sufficient number to warrant the expense of forming the shape in molds or dies, so that steel can be used for the panels, the process of manufacture is simplified.

Features in Design

On the design here illustrated, the front of the body, from the door line forward, including the two sides and the cowl will be made in three pieces, for sake of economy in material and handling. The joints where the panels meet can be successfully welded so that the surface will be perfect for painting and have the strength of a single sheet of metal. The rear panel can be either in one or two pieces and the doors are made without moldings to cover the joints. The entire absence of moldings is one of the characteristics of modern body designing, the influence exerted by the desire to have the unbroken surface for stream line effect has been the principle reason, and, also builders for years have endeavored to have the same outward appearance to a metal body, that a wood panel body presents.

Aluminum or steel may be used for panels according to the facilities of the builder for shaping the metals.

The sides of this body are low, 22 in. only, and the cowl is



1.—Four-passenger body on a 122-in. wheelbase chassis with 32-in. wheels. Two centrally placed doors are used with the front seat built in from the body side top line

2—A five-passenger body on a 132-in. wheelbase chassis with 34-in. wheels. In this design the rear seat is wide enough for three persons and the hinged armrest folds into the trimmingwhen not in use

3—Six-passenger body mounted on a chassis of 142-in. wheelbase with 36-in. wheel. This is a four-door body and the front line is curved to avoid the bent line of the cowl as it meets the side line of the body

1½ in. higher than the rear of the body. The cushions are low and the room in front of the seats is long to compensate. The doors are 21 in. wide and open toward the rear. The steering wheel is well back from the dash and low and the distance from the dash to the center of the rear wheel is 88 in. The body space is 12½ in. more or 100½ in. There is a foot rest for the rear seat as shown on the plan and all the essential dimensions including the tilt of the windshield are indicated. The shield is in two pieces, the lower part shown inclined inwardly to ventilate.

Five-Passenger Design

Fig. 2, shows a five-passenger body mounted on a 132-in. chassis, with 34-in. wheels and the gasoline tank at the rear. The distance from the dash to center of rear wheels is 92 in. and the body space 13 in. more or 105 in. The required dimensions are registered on the two views and are self explanatory.

This design differs from the previous one in that the rear seat is wide enough for three persons and the hinged armrest, folds into the trimming at the back of the seat when not in use and when down, and forms a partition, dividing the seat into two places. Another difference is the style of top, which is a Victoria. The windshield at the rear of the front seat, is high enough to meet the top edge of the front bow of the top and so prevent the wind entering. It carries two celluloid lights and for stormy weather there is an extension, indicated by dotted lines, that is fastened with buttons to the front of the top and to the top of the front windshield. When not needed it is folded away.

The Victoria top adds a pleasing look and when used in conjunction with the shield, as illustrated, the drag effect due to wind pressure is minimized. To obtain satisfactory working results in raising and lowering the top, the covering should be some other material than leather. Leather looks by far the richest, but better knockabout results are obtained with a more flexible goods. Kaki looks well, it does not show the dust and will not crease. The shield can be covered with the same material, and the extension roof and the slip covers can be the same.

The shield is made to be stationary, and is oval shape steel rod. The frame and method of covering are identical with the practice used on carriage dashes. The two studs at the bottom engage the socket irons that project from the back of the seat, and nuts on the under side keep same in place. The celluloid lights are stitched in the same as on the top curtains.

The sides of the body are a trifle higher than Fig. 1, and the increased body width, makes the seating proportions very generous when used for four passengers, but there is ample room for the five when required. The description of the construction is generally applicable for both bodies. The doors are without moldings and the top edge of body side is rounded, the front door opens toward the front and the rear door toward the rear, all hinges and handles being concealed.

A Six-Passenger Body

Fig. 3, is a six-passenger body mounted on a 142-in. wheelbase chassis having 36-in. wheels, gasoline tank at the rear, and the distance from dash to center of rear wheel being 95 in. The body space is 15 in. more or a total of 110 in.

This design has in common with Figs. 1 and 2, doors without moldings and the top edge of body rounded as well as the graduated top line. This line blends into the cowl forming the top of the front seat back. The body sides are higher than Figs. 1 and 2, and under the cowl at the rear, the extra seats are folded when not in use. They are shown in dotted lines in this position, as well as in the position for use. Above the space required for stowing the seats, there is room for small lockers, opening outward in the tonneau.

The dimensions amply located on the two views, show without further description the capacity and size of the body. The doors are four in number and the front line is curved to avoid the bent line of the cowl as it meets the side line of the body. They are made without moldings and open in opposite directions, this is optional, as all doors can open toward the rear if desired.

Upholstery Features

The plan views show two trimming designs. Figs. 1 and 2 have a long pipe caught with buttons and Fig. 3 is a design with the turkish or arm chair upholstery. This latter is the newest style and makes a pleasing looking car and is made thick so that it is very comfortable. The leather for this trimming design must be very pliable and the straps serve the same purpose as the buttons on Figs. 1 and 2. Design 3 has also the advantage of being easily kept clean. Leather is still the most preferable material used for open body trimming, some motor cloth is used and on cheap cars the imitation leather is finding favor and is being used more than formerly.

The principle change made in trimming these styles of bodies, has been the doing away with the roll of trimming that appeared above the side line of the body and seat, in some cases it appears slightly above, but on the majority of new cars it has been lowered out of sight.

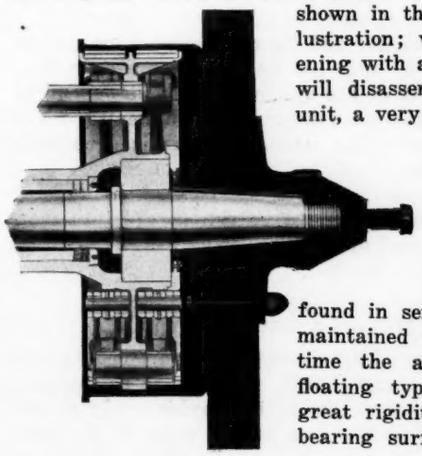
The appointments include the regulation cigar lighter and ash tray and clock, and there are pockets of the doors and robe rail and foot rests, the robe rails are mostly the flexible kind made of a strap and fastened to the rear of the front seat, and the Auster windshield at the rear of the front seat is used more than formerly.

Door handles on this type of body are all inside, and the hinges are both the concealed and the outside curved hinge, linoleum is the best material for floor covering for the toe and foot boards and running boards and leather bound carpet in the tonneau. The top material is either burbank or pantesote and the victoria top goods should be kaki or burbank, preferably kaki. The extra tires are carried at the rear on most cars and the preponderance of color designs are dark shades and blue predominating.

These illustrations are intended to serve the purpose of presenting the design of each model, amplified by dimensions in figures and the description above given is intended to supplement the above two thoughts up to this point only.

Sheldon Semi-Floating Axle

THE Sheldon Axle Co., Wilkes-Barre, Pa., has brought out a semi-floating axle in which the criticism of inaccessibility which has often been leveled at semi-floating axles cannot possibly apply. With this design all that is necessary in removing the wheel from the axle is to insert the bolt as shown in the accompanying illustration; whereupon a tightening with an ordinary wrench will disassemble the complete unit, a very simple operation.



This design is specially applicable to commercial vehicles and with it the excellent bearing surface generally found in semi-floating axles is maintained while at the same time the accessibility of the floating type is secured with great rigidity due to excellent bearing surface.

Communications

¶ The editor of the Rostrum is anxious to secure from car users and others, communications dealing with the overcoming of difficulties in making repairs and in the numberless other phases of every-day automobiling. This department is mutual and is a common ground upon which an interchange of ideas and opinions can be made as freely as in the clubroom.

The Rostrum

Inquiries

¶ The purpose of the Rostrum department is primarily to aid in the solving of motorists' problems. Readers of THE AUTOMOBILE *are requested to allow our editorial staff aid in the solution of difficulties as they arise and perhaps through this assistance reduce the cost of upkeep of their cars and gain a useful knowledge in the economical phases of the vehicles.*

Lengthening Wheelbase Spoils Steering Layout

EDITOR THE AUTOMOBILE:—Will you please advise me if the lengthening of the wheelbase of an automobile 10 in., moving the front axle forward and moving the rear axle back 10 in., will upset the steering layout and if so, how can I correct it? The original wheelbase was 90 in., and is now 110 in. after the change.

Cambridge, Mass. SUBSCRIBER.

—Lengthening the wheelbase throws the steering layout out of arrangement a considerable distance and theoretically prevents the car from turning about a fixed center as it should when the steering gear is correctly laid out. Referring to Fig. 1, the effect of altering the steering of the wheelbase becomes apparent. Assuming a car, wnich in the normal condition has its wheels at AB, the steering layout is so arranged that when the wheels are turned to any position, such as CD, the spindle axes produced should meet at a point E somewhere along the line EF or the axis of the rear axle produced. If the wheelbase is lengthened 10 in., so that the line EF is moved back to E′F′ instead of intersecting at a point, the lines of the spindle produced will fall upon the line E′F′ at some such point as ee′. Therefore, instead of tending to rotate about one point, the car tends to rotate about two points which is impossible and therefore sliding action results.

Soda for Cleaning Radiator

Editor THE AUTOMOBILE:—Can you tell me how to clean out my radiator? The water here is quite hard and hence scales form. What will remove it? Is it necessary to remove the rubber hose when cleaning? A. J. WHITE.

Schenectady, N. Y.

—Your radiator can be cleaned by the use of ordinary washing soda dissolved in boiling water. To a water pail full of boiling water add a couple of double handfuls of washing soda, forming about a saturated solution. This is poured into the radiator and the car operated for a short time, possibly three or four minutes, to let the soda thoroughly reach all parts of the system. It is followed up by clear water, which rinses out the soda and the matter which is loosened by its cleansing action. If this is done quite frequently, the radiator will be kept free of scale. It is not necessary to remove the rubber hose connections in doing this, as, in fact, the motor must be run in order to thoroughly reach every part of the circulating system with the soda solution.

Seems to Have Carbureter Trouble

Editor THE AUTOMOBILE:—I seem to have much trouble in starting my 1912 model E.M.F. It seems to be the ignition at times. I can start the car by cranking only at certain times, and then again I need only to press on the short circuit button. At other times, I need only to throw the switch over on the magneto and back on the battery to start the car. When it will not start by cranking, it will start by pressing the button, and sometimes, when it is not right to start by pressing the button, it will start by cranking. What would you suggest as a remedy? V. M. C.

Adrian, N. D.

—Going over the symptoms of your trouble, it would seem that it might be due to any one of four causes. These are, 1, gasoline line to carbureter clogged or float valve stuck; 2, water in gasoline, try cock on carbureter and tank; 3, carbureter adjustment too lean for starting purposes, and 4, improper carbureter dash adjustment. This should be set to choke air from the carbureter.

All of these are obvious and can be remedied readily except the last. In view of the fact that the carbureter dash adjustment is an improvement for aiding the starting of these motors, and was brought out since the production of these cars, it might be well to fit one of these in order to secure better results with the low-grade fuel at present on the market. The Studebaker parts list gives the following names and prices of the parts which you will need:

1 A-3455, carbureter air valve assembly	$0.25
1 A-3461, carbureter air valve adj. screw	.15
1 A-3463, carbureter air valve control assembly	.25
1 A-3464, carbureter air valve seat and lever sub-assembly	.35
1 A-3479, hot air throttle and tube connection wire	.05
1 A-3480, hot air throttle and tube connection assembly	1.00
1 A-6 x 2, carbureter control cotter	.01
Total	$2.06

The handiest for you to obtain these parts would be from Mr. George Young of La Moure, N. D.

If after going through all the above possible causes, you do not locate your trouble, it is suggested that you examine for air leaks the joints of the carbureter, intake manifold, valve stem and guides and look for porous castings. All these joints should be absolutely air tight. Examine the spark timing and the strength of the spark. See that the valves are properly adjusted and seated or, in other words, that the compression is good and then see that all wiring connections are tight.

If you have gone over all the above carefully, there is no doubt but that you will locate your trouble. In inspecting for wiring difficulties you should begin at the switch, carefully examining the switch bars to make sure that a good, clean contact is being made between the segments. Also trace all wires leading from the coil to see that there are none broken beneath their insulation, or the insulation worn off, allowing them to come into contact with some metal part of the car, causing a short circuit. The wires should all be securely fastened to their respective terminals. The breakers should be examined and set at 0.025 and the distributer contact should be free from dirt and making a good positive contact. The sparkplugs should be examined for broken insulation, etc., and here also the gaps should be set at 0.025 in. If you find that the trouble is in the coil

or magneto, it would be better not to attempt to repair it yourself, but take this up with the Splitdorf Electrical Co. direct.

Suggests Source of Oiling Trouble

Editor THE AUTOMOBILE:—Noting the trouble of Mr. George F. Tuttle, with a Buick oiling system, as mentioned on page 988 of THE AUTOMOBILE for June 3, will suggest the following as a possible solution.

If oil was put in the reservoir as well as in the crankcase proper and connecting-rod bearings and burned out in ten miles, it was possibly due to pump failure.

When a system of this type is emptied out and refilled, it frequently happens that the pump becomes air-bound and can be started by lifting the discharge check and filling up with oil, noting that the vane is at its maximum height. Drop the check back in place, and the pump will start unless the suction valve is locked.

I failed to read in Mr. Tuttle's remarks any reference to the sight feed, as to whether or not the oil was being circulated.

If he is not sure as to the above, I am of the opinion that pump failure was the cause of his trouble. B.

Baltimore, Md.

Buick 43 Went 55 Miles per Hour

Editor THE AUTOMOBILE:—Would like the following information concerning the Buick 1912 model 43 touring car.

1. Revolutions of motor per minute.
2. Maximum speed of car.
3. Description of connection of clutch with transmission, and also transmission and front end of driveshaft. Can this joint be made so that it will not leak grease? If so, how? H. F. MURRAY.

Brooklyn, N. Y.

—The motor in the Buick model 43 is stated by the makers to develop 50 horsepower at about 1800 r.p.m. With 3.5 to 1 gear ratio and 36 x 4 tires, this would give a car speed of about 55 miles per hour.

2. This is answered under the above reply.

3. The connection between the clutch and the gearset was by means of a square shaft and Oldham coupling, and the connection between the gearset and driveshaft was through a Spicer universal joint, the driving flange of which was fitted to the squared end of the gearset mainshaft. This gearset was designed for the use of steam engine cylinder oil as a lubricant and oil retainers with double grooves and drain-backs into the case were fitted outside the bearings. According to the Buick company, difficulty was never experienced in keeping the cases oiltight, but no doubt heavy grease would eventually clog the oil drains and finally work its way out upon the shaft. The remedy would be, of course, to clean out the casing and to use the lubricant intended for it.

D. D. Buick the Original Designer

Editor THE AUTOMOBILE:—Who designed the first Buick engines, and when was this done?

2. When, and by whom was the Chevrolet engine designed?

3. How often should a storage battery be cleaned and refilled with liquid? H. L. B.

Hughesville, Pa.

—D. D. Buick was the original designer of the Buick type valve-in-head motor. He started to build this motor for stationary and marine purposes in 1902 in Detroit, and the year after he was joined by Walter L. Marr, who is now chief engineer of the Buick Co. Together they developed the Buick two-cylinder motor, which later became quite well known in the model F.

2. The overhead valve motor used in the Chevrolet cars of today was designed by Arthur Mason, of the Mason Motor Co., in 1912. It was perfected and put out on the market in 1913.

3. A storage battery should be tested and filled with pure water without fail once every week in summer and every two weeks in winter.

Using Too Much Fuel Under Load

Editor THE AUTOMOBILE:—I have a model 38 Overland with Remy magneto and Schebler carbureter. This car seems to choke and for some time it has been using considerable fuel on hard pulls or when speeding up to 20 miles an hour or over. When I throw out the clutch it takes several seconds before the engine will race and fire all around. Then it pulls like a tractor for a while. I sent the magneto back to the factory some time ago and I don't think it is at fault. I thought at first that the fuel line was clogged up, but found this was not the cause. Can you tell me what the probable cause of this trouble is? W. E. WADE.

Kenton, Tenn.

—Regarding the possibility of carbureter trouble, the model 38 Overland used at different times Schebler models D, E and L, which were regularly fitted to these cars. This renders it difficult to give exact information, and if you are convinced it is the carbureter it would be well to pick out the model on your motor from Fig. 2, which illustrates these three types. The exact information could then be given without trouble.

With the instrument generally employed in connection with the model 38, use was made of a spring control auxiliary valve. This valve is guided to its seat through the use of a stem on which the valve stood vertically, governing the auxiliary flow of air. When this stem or valve casting became worn to any extent, its action was likely to permit a chatter or side action. This, of course, would affect the density of gas saturation delivered to the motor and would make the motor sluggish at lower speeds. As soon as the motor, however, had maintained such speed as would keep the air valve constantly off its feet, a more uniform mixture was sent through the manifold and a more satisfactory running condition resulted.

The same condition which you have pointed out in your letter can be caused from ill seating or improperly fitting pistons and piston rings. Loss of compression is not noticeably so detrimental to the efficiency of the motor when it is running at higher speeds, and it is possible that the valves have become carbonized to the extent that they need regrinding. It would be a good idea, therefore, to have the

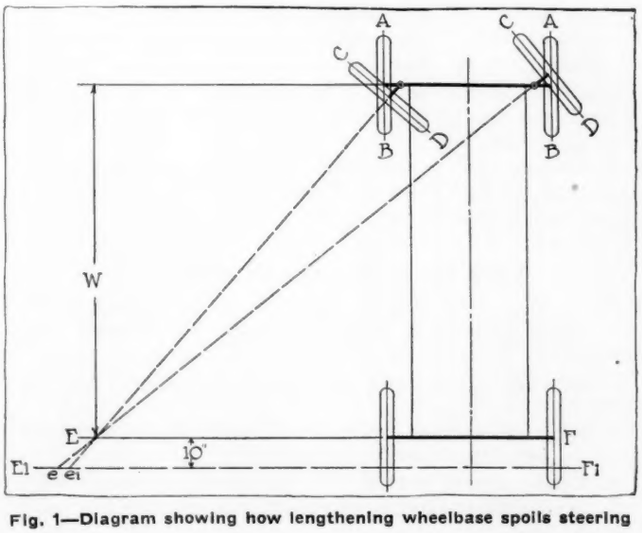


Fig. 1—Diagram showing how lengthening wheelbase spoils steering

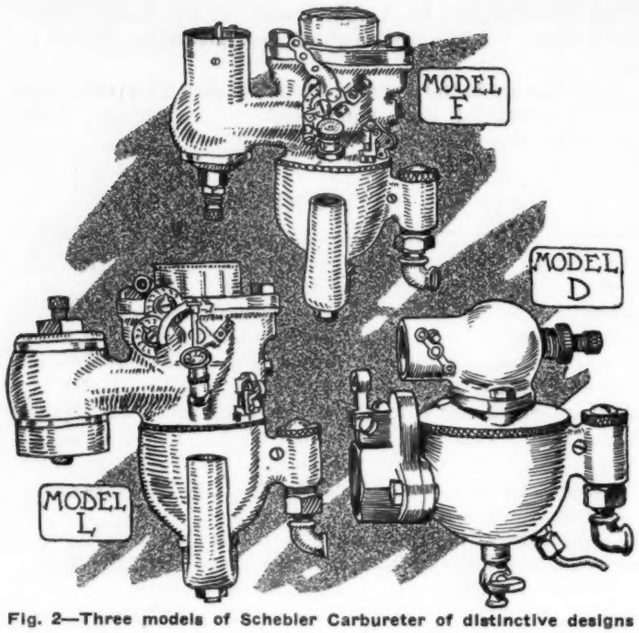


Fig. 2—Three models of Schebler Carbureter of distinctive designs

carbon removed and the valves ground to a firm seat before trying to make any further adjustment of the carbureter. One of the facts which must be realized is that this carbureter was made for a better grade of fuel than that which is at present on the market, and no doubt the heavier fuel which you are compelled to make use of is partially to blame for the trouble.

Ford Branches Equipped for Grinding

Editor THE AUTOMOBILE:—Can you tell me whether the branch plants of the Ford Co. regrind cylinders and fit pistons. What are the costs and can you recommend the nearest branch to me? C. R. ALDRICH, M.D.

Brattleboro, Vt.

—The branches of the Ford company which are equipped to rebore model T cylinders and install 1-32 oversized pistons are the followin:

Atlanta	Dallas	Milwaukee
Buffalo	Fargo	Omaha
Chicago	Houston	Oklahoma City
Cambridge	Indianapolis	Philadelphia
Cleveland	Kansas City	Pittsburgh
Cincinnati	Los Angeles	Portland
Columbus	Long Island City	San Francisco
Detroit	Minneapolis	Seattle
Denver	Memphis	St. Louis

When the cylinder is out of the car there is a labor charge of $3.00 net, covering rebabbitting, reboring and fitting of oversize pistons.

Brattleboro, Vt., is controlled by the Cambridge (Mass.) branch, and cylinders in that territory in need of reboring should be returned to Cambridge.

Gear Ratio of 1915 Oldsmobile

Editor THE AUTOMOBILE:—What is the gear ratio of the 1915 Oldsmobile model 42 on all speeds, low, second and direct?

2—At what engine speed does this car produce its highest power?

3—What is the gear ratio on all speeds of the Overland 81, Hupmobile 1915 model and Buick 27?

4—What make of engine is in the Oldsmobile model 42?

5—Is this motor made by the Northway company?

Eden, Idaho. J. LEVIN.

—The gear reductions of the Oldsmobile on all speeds are as follows:

First speed	13.4 to 1
Second Speed	7.05 to 1
Third speed	4 to 1
Reverse	17.3 to 1

2—The model 42 Oldsmobile gives its maximum horsepower at 1,900 r.p.m.

3—The gear ratios of the Overland 81 are:

First speed	3 to 1
Second speed	1.8 to 1
Third speed	3.9 to 1

Since the rear axle is geared 4 to 1, the final reductions are found by multiplying each of these reductions by 4. The reductions on the Hupmobile models are as follows:

MODEL K

First speed	14.4 to 1 and 15.5 to 1
Second speed	7.20 to 1 and 7.65 to 1
Third speed	4.0 to 1 and 4.25 to 1
Reverse speed	18.31 to 1 and 19.47 to 1

MODEL H AND HA

First speed	16 to 1 and 16.7 to 1
Second speed	8 to 1 and 8.42 to 1
Third speed	3.6 to 1 and 3.86 to 1
Reverse speed	20.34 to 1 and 21.1 to 1

The reductions on the Buick Model 27 are as follows:

First speed	11.76 to 1
Second speed	5.25 to 1
Third speed	3.50 to 1
Reverse	15.12 to 1

4 and 5—The engine is designed by the Oldsmobile company but is manufactured by the Northway Motor & Mfg. Co., which is a part of the General Motors organization.

First Welch Six Built in 1909

Editor THE AUTOMOBILE:—When did the Welch Motor Co., Pontiac, Mich., first produce their first six-cylinder motor?

Detroit, Mich. C. G.

—The first six-cylinder car turned out by the Welch Motor Co. was built in 1909. The car sold for $7,000. A 75-horsepower 4 5-8 by 5 motor was used. The radiator was a honeycomb. Other features of the car were multiple-disk clutch, and 36 by 5-inch tires. The wheelbase was 138 inches and the tread 56. The weight was 4,400 pounds.

How to Pronounce Car Names

Editor THE AUTOMOBILE:—What is the correct pronunciation of the names of the following automobiles: Delage, Mercedes, Chevrolet and Peugeot?

Taylor Ridge, Ill. A SUBSCRIBER.

—The pronunciations of the names given by you are as follows: Delage, Del-ahge; Mercedes, Mer-se-dees; Chevrolet, Shev-ro-lay, and Peugeot, Per-joh.

Liquid Carbon Removers Satisfactory

Editor THE AUTOMOBILE:—Having seen several articles in different magazines concerning the different solutions for removing carbon from motors, and wishing to know if any of these solutions have been tested and found reliable, I would like you to give me the name of any firm or dealer who handles a solution that you know to be reliable? I have never had much faith in these carbon removers because I have been unable to find any one who has tried any of them.

Thiells, N. Y. CHESTER L. ORNE.

—A number of liquid solutions for removing carbon are successful and although they cannot be listed here, any of the brands which have been on the market for some time will probably be found to do all that is claimed for them. They merely act as carbon solvents and therefore are not as quick and positive in their action as scraping or burning carbon from the cylinders. The best way to convince yourself of their efficacy is to scrape some lump carbon from the motor, place it upon a piece of cast iron and put a small portion of the carbon remover upon the carbon and watch the

action. Two points, however, must be watched with great care in using these removers, the first being that they do not attack the metal of the cylinder wall and the second that the lubricating material in the crankcase is not destroyed by the leaking of the carbon remover past the piston. After many of the removers are used, it is necessary to empty the crankcase and refill with new oil, therefore, the best time to remove the carbon is at the time when the oil itself is to be renewed.

Gear Ratios at Different Speeds

Editor THE AUTOMOBILE:—Kindly inform me the gear ratios of the following cars on their different speeds. What I desire is not the final gear reduction between the motor and rear wheels but the actual reduction in the gearbox. Stutz, Mercer, 1914; Mercer 1915; Marmon 41; Simplex and Packard 48.

N. Y. City. SUBSCRIBER.

—These gear ratios are as follows:

MERCER

Series H & O		Series J		Series M	
1st speed..	9.66 to 1	1st speed...	8.58 to 1	1st speed....	10.2 to 1
2d speed...	5.20 to 1	2d speed...	4.62 to 1	2d speed...	5.49 to 1
3d speed...	3.86 to 1	3d speed...	3.47 to 1	3d speed...	4.08 to 1
4th speed..	2.82 to 1	4th speed..	2.52 to 1	4th speed..	3.00 to 1

SIMPLEX 38 AND 50 HORSEPOWER

1st speed	4.03 to 1
2d speed	1.98 to 1
3d speed	1.32 to 1
4th speed	Direct

MARMON 1914 AND 1915 MODEL 41

	1914	1915
Countershaft drive gear	18 teeth	18 teeth
Second speed sliding gear	23 teeth	23 teeth
Low and reverse sliding gear	33 teeth	33 teeth
Countershaft constant mesh gear	33 teeth	33 teeth
Countershaft intermediate gear	28 teeth	27 teeth
Countershaft low speed gear	18 teeth	18 teeth
Countershaft reverse gear	14 teeth	14 teeth
Reverse idler gear	16 teeth	18 teeth

PACKARD MODEL 548

Motor speed at 900 revolutions per minute.
Diameter of rear wheel, 37 inches; circumference 9.686 ft.

With 28-Mile Bevel Gears

First speed, 17/39 x 23/33 x 15/53—.0859 ratio.
Second speed, 26/30 x 23/33 x 15/53—.1709 ratio.
Direct drive, 15/53—.283 ratio.
First speed, 8.5 miles per hour.
Second speed, 16.93 miles per hour.
Direct drive, 28 miles per hour.
Reverse, 8.5 miles per hour.

With 31-Mile Bevel Gears

First speed, 17/39 x 23/33 x 17/54—.0956 ratio.
Second speed, 26/30 x 23/33 x 17/54—.1901 ratio.
Direct, 17/54—.3148 ratio.
First speed, 9.47 miles per hour.
Second speed, 18.83 miles per hour.
Direct drive, 31 miles per hour.
Reverse, 9.47 miles per hour.

The Stutz ratios are not available at the present time.

The gear ratios as given here are in the same order or arrangement as given by the factories of the different companies. It will be noted that some of these are given in terms of total ratio between crankshaft and rear axle and others in reductions in the gearset. In the case of the Marmon, the number of teeth are given and in calculating any desired ratio with these, it must be remembered that the ratio of one gear wheel to another is in direct proportion to the number of teeth.

Wiring Spot Light for a Ford Car

Editor THE AUTOMOBILE:—Will you kindly let me know how to wire a spot light from the Ford magneto and battery? Also size of light to be used?

Buffalo, N. Y. R. KAYSER.

—The wiring of the spotlight from the Ford magneto and battery would require a single lamp of 16 volts or two lamps in series of 8 volts each. One wire would go to the magneto terminal, coming from the top of the gearbox cover and the other wire from any part of the metal on the car. This could not be used in conjunction with the battery as you would only get 6 or 8 volts from a battery which would not light the lamp required by the magneto.

Cid Rotary Valve Motor Still on the Market

PARIS, FRANCE—Editor THE AUTOMOBILE:—In THE AUTOMOBILE for April 1 an article entitled Rotary Valve Makes Slow Progress states that the Itala type of valve is only one now built in Europe, and that the Cid rotary valve motor never has been put on the market. This is not quite correct. The Cid motor was first shown at Paris salon in 1910, and has been on the market ever since. It is still produced at Dijon. This type of motor appears to have given satisfaction, but the output of the firm is not great. The Henriot type, as adopted by Darracq, proved a failure and has long been abandoned, although a determined attempt was made to overcome its inherent defects. The Argyll type of single sleeve motor, although not really a rotary, might be mentioned as produced by the Piccard-Pictet company, in Switzerland. Two of these cars ran in last year's French Grand Prix. The only non-poppet valve motors now built on the Continent of Europe are Knight, Itala, Argyll and Cid. Half the factories of Europe were interested in some type of non-poppet valve motor 2 years ago, but since then interest has dropped to zero. The "valveless" motor is dead as a talking point."—W. F. BRADLEY.

Sheffield Scientific School Maxwell Test

Editor THE AUTOMOBILE:—In THE AUTOMOBILE for May 13 there was a news item regarding an efficiency test on the Maxwell car which was made by the Sheffield Scientific School of Yale University. Would you kindly inform me what kind of tires were used on this test?

Indianapolis, Ind. H. H. K.

—The accompanying is a full report of the test which will give you the information you desire along with the other data secured.

Test at the Mason Laboratory of Mechanical Engineering, Sheffield Scientific School, Yale University

1. Type and model of car—Touring, model 25, 1915.
2. Owner—Biever Motor Car Co., New Haven.
3. Weight with driver—1850 + 150 = 2,000 pounds.
4. Wheelbase—103 inches.
5. Cylinders—Four, 3⅝ x 4½ inches.
6. Gear ratio, direct, measured—3.55 : 1.
7. Tires, size—30 x 3½ inches.
8. Tires, make United States—Chain, inflated to 65 pounds.
9. Carburetor—K. D.
10. Ignition—Sims magneto.
11. Starter—Sims-Huff, electric.
12. Wind resisting area, measured—4.5 x 4.5 = 20 sq. ft.
13. Rolling resistance by dynam.—36 pounds.
14. Gasoline from Mason Lab.—Specific gravity 0.724 at 69 deg.

POWER AND FUEL MEASUREMENTS

Speed, miles, per hour	Drawbar pull, pounds	Horse-power at rear tires	Grade, per cent.	Mileage, miles per gallon	Fuel, pounds per h.p. per hour	
10.2	42	1.2	0	33.8	1.57	level
19.8	60	3.2	0	33.2	1.13	level
30.1	90	7.2	0	23.2	1.08	level
40	132	14.1	0	19.3	0.88	level
				Av. 27.4	Av. 1.16	level
10.6	249	7.0	10.3	9.5	0.95	full load
20.6	254	14.0	9.7	11.3	0.78	full load
30.7	209	17.1	6.0	13.2	0.82	full load
40.3	160	17.2	1.3	14.	1.01	full load
				Av. 12.0	Av. 0.89	full load

Tests made April 30, 1915, under direction of E. H. Lockwood and F. Q. Boyer.

Gas Brake vs. Mechanical Friction Brake

Using a motor brake as a service brake is said to economize considerably on wear of solid rubber tires, on the principle of obviating the blocking of wheels. Any similar resistance effected by gases should have the same result and might also be available for regulating the speed of coasting and for otherwise moderating the driving speed more conveniently than by lowest throttling and slipping of the clutch.

ACCESSORIES

Atlas Gasoline Improver on Test

A FLUID for the purpose of increasing the effectiveness of fuel is on the market. It is put up in packages containing five small phials of the material, each phial being sufficient to treat 5 gallons of gasoline. It is claimed that the material will increase the mileage per gallon and also increase the speed for a given throttle opening.

The material is said to be composed of a compressed mixture of hydrogen gas, gasoline and a very small amount of water. The exact composition is a secret, but an analysis shows that it does not contain any of the common constituents used for doctoring fuel. A test by an analytical chemist showed that there was no ethyl ether, picric acid or camphor in the solution. These are the three components which are generally found in so-called fuel improvers.

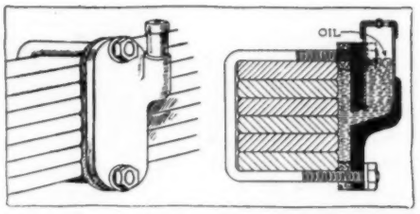
Used by Fire Department

The material is said to be used by the fire department of Chicago for use in patrol work. It has been tested out by others in Chicago during the past 4 or 5 years and at the request of the Eastern distributors the test was made upon the substance by a representative of THE AUTOMOBILE. The run was carried out on a level stretch of road near Coney Island, known as Ocean Parkway. A Ford car was used in the experiment and after the tanks had been drained and the motor allowed to run until it came to a stop a quart of measured untreated fuel was poured in. The throttle opening was fixed to a definite point and locked in this position and the spark also fixed. On the quart of plain gasoline, the car ran 6.5 miles at an average speed of 17.1 miles per hour.

At the completion of the first run after the motor had come to a stop, the car was brought back to the starting point and a quart of the treated gasoline placed in the tanks which were emptied in the same manner as previously. Under the same conditions of spark and throttle setting the distance traveled by the car was 7.3 miles and the average speed 20 miles per hour. This gives a comparative mileage per gallon of 26 with standard gasoline and over 29 with the treated material. Furthermore, the average speed was increased for a corresponding throttle setting approximately 3 miles per hour. The improver sells for 25 cents a package and enough is contained in each package to treat 25 gallons of gasoline. The distance measurements were made with a Jones speedometer which was not checked for accuracy, but since the measurements for both treated and untreated fuel were made with the same speedometer, any differences should offset themselves.—Atlas Gasoline Improver Co., Chicago, Ill.

Leaf Spring Oiler

A leaf spring oiler made in six sizes to fit all size springs has recently been brought out which is said to work the oil between the leaves while the car is operating. The device is so arranged that when oil is placed in the oil cup on the side of the device, as illustrated, it is led down along the sides of the spring and the motion of the spring permits the oil to work its way in between the leaves, keeping them lubricated. The device is also made in another and cheaper style without the oil cup, but with an oil hole. A special set of four of the cheaper style is put up for Ford cars at a price of $1.60. The regular price is 50 cents apiece for the style without the oil cup and 75 cents apiece for the style with the oil cup.—Grus Leaf Spring Oiler Co., Chicago, Ill.



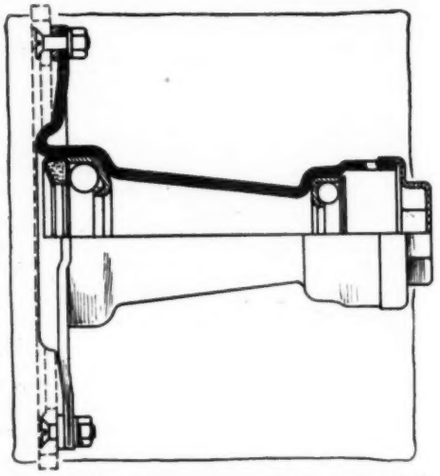
Grus leaf spring oiler clamped against side of spring

Graphonoil Lubricant

A new graphite and oil lubricant has been introduced in which a thin film of graphite is stated to be spread over all the working and bearing parts with which the lubricant comes in contact. The material which is called Graphonoil is stated by the manufacturers to have effected a change in the graphite which makes it mingle with the oil and not be suspended in it. It is stated that with its use there cannot be any precipitation of the graphite and the entire constituency will pass through a mechanical filter. It is claimed not to carbonize and to effect a saving as the feed can be reduced with it.—The Winslow Lubricating Co., Buffalo, N. Y.

Dry Battery Car Lamp

For automobiles without electric lighting sets when a moderate illumination is required now and then for short periods, there is a great deal in favor of dry batteries as a source of current, as they are less trouble to look after than oil lamps. The Wireless Autolight is a well-made case supplied with a lamp and reflector, glazed in white, green or red. It takes a standard No. 6 cell and three lamps complete cost $10.—Peck Engineering and Mfg. Co., Rochester, N. Y.



Part section through hub of Mott wire wheel for Ford cars

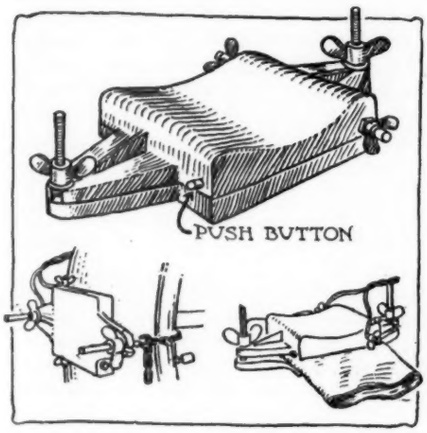
Air Shock Absorber

This device is not a supplementary spring, but a main spring damper. It is attached to the axle and to the frame of the car, the connecting pins being parts of small universal joints so that the action is not interfered with by side sway or irregular action of the main spring. A bronze piston is normally located about the middle of a bronze cylinder, both ends of which are closed. From one end to the other there is a minute passage so that air can pass from top to bottom and *vice versa*, but only quite slowly. Thus when the cars runs over a bump the piston moves down the cylinder and forces air through the bypass to the upper end, to damp the recoil following the bump, this air has to return to the bottom of the cylinder again, so the absorber is double acting. There is an adjustment which sets the size of the passage and so enables the action to be made easy or stiff according to requirements. Prices vary from $75 up to $120 according to size, per set of four.—Air Shock Absorber Co., Boston, Mass.

Premier Electric Vulcanizer

An electric vulcanizer weighing but 2 pounds is shown in the accompanying illustration. This device operates from

the 6-volt storage battery usually carried in the car and is provided with a thermostat which automatically cuts off the current as soon as the vulcanizer attains the correct heat for vulcanizing the repair on shoe or inner tube. It will take any size tire up to 5 in. diameter. The vulcanizer may be used either in a garage or on the road, being simply clamped to the tube or casing, two wires being connected to the battery and contact applied through a button. The simplicity of operation of the device is said to render it of value in quickly healing up small cuts in casings as soon as discovered, thereby preventing moisture from working in and rotting the fabric. The device sells for $3.50 complete with repair gum and 10 ft. of wire cable.—Premier Electric Co., Chicago, Ill.



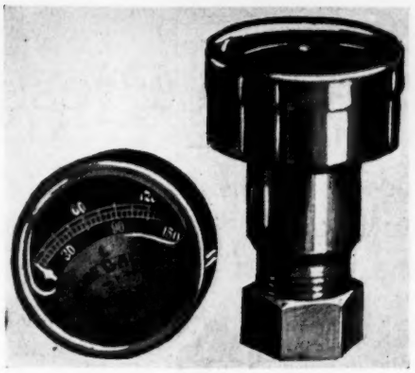
Premier electric vulcanizer at work

Valve Seating—A very complete outfit for repair shops with a wide range of cutter for truing valve seats is among the most interesting New Era products. Described in the same leaflet is a small tool for dealing with the valves themselves.—New Era Spring and Specialty Co., Detroit, Mich.

Automatic Vulcanizer

A vulcanizer which is automatic in that after gasoline enough to saturate a wick has been poured in, no further attention need be paid to it, has recently been put on the market under the name of the Worcester automatic vulcanizer. The principle upon which the device operates is the same as for other gasoline vulcanizers, except that it contains a wick and does not allow the gasoline to remain free in an open chamber.

With the wick arrangement it is possible to apply the vulcanizer to the wheel for work on the casing as the gasoline cannot pour out, while for work on tubes it is used in the same way as other gasoline vulcanizers. In operating the vulcanizer, on a casing the cut is cleaned as much as possible with sand or emery paper and washed with gasoline enough uncured rubber to make a smooth surface is added and cleaned with gasoline after which it is applied to the casing and the vulcanizer applied with a piece of paper between the metal of the vulcanizer and the prepared rubber. The asbestos working is unsaturated with gasoline and ignited and allowed to burn until the flame goes out. After this the vulcanizer is allowed to remain in place for 5 min.



MacDonald's tire gage valve-cap

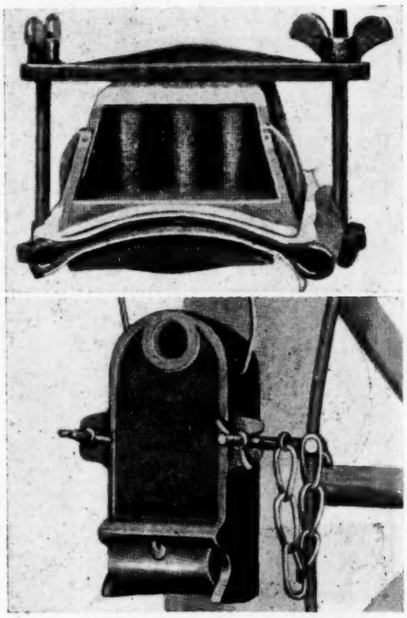
For inner tubes the same process applies, only enough rubber being used to cover the puncture. The heat radiated through the vulcanizer due to the burning of gasoline has been gauged to maintain the vulcanizer at the proper temperature. The vulcanizer weighs 4.5 lb. and its price is $3.50 f.o.b. Worcester.—Worcester Mfg. Co., Worcester, Mass.

Ford Wire Wheels

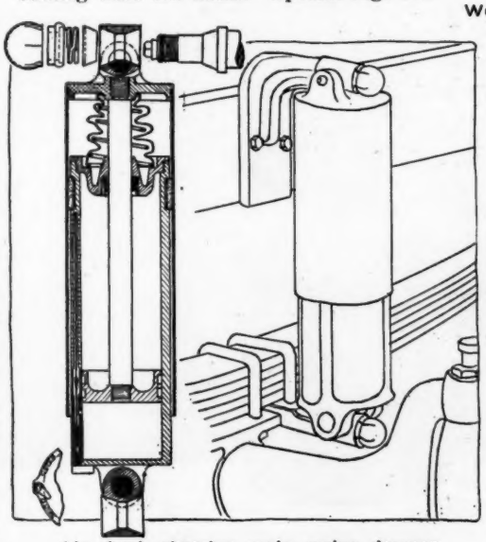
Those who wish to fit their Ford with a set of wire wheels can do so very easily with the set supplied by the Mott company, as these can be put on without any alterations to the axles. It is necessary merely to remove the old wheels, clean the axle ends and put the wire set in place. The Mott wheel has a demountable rim and one spare is included with the outfit. The drawing shows the fitting of a front wheel, the ball cups and balls coming with the wheel. Special lugs are provided on the right front wheel for the attachment of the speedometer drive. The change can be quickly made by an amateur without trouble.—Mott Wheel Works, Utica, N. Y.

MacDonald's Tire Gage

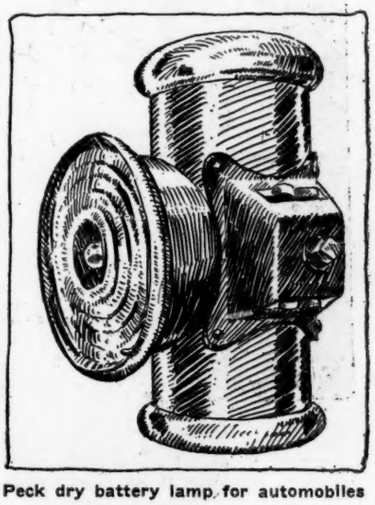
A valve cap which is a perpetual pressure indicator has been brought out recently and should merit the attention of owners who desire to keep a careful check on the inflation pressures of their tires. This gage displaces the ordinary cap and acts itself as an air seal. With this tire gage leaky valves are eliminated because the valve itself is held wide open by the gage cap and the gage itself is air tight. The device is shown in the accompanying illustration and as will be noted, has a dial which at all times indicates the pressure in the tire. The price for a set of four of these is $6.50.—J. F. MacDonald Mfg. Co., Nevada, Iowa.



Worcester automatic vulcanizer for tubes and casings



Air shock absorber main spring damper



Peck dry battery lamp for automobiles

Dodge Uses 750-Ton Press for Hub Caps

Seventeen Operations to Complete a Hub Cap—Big Press Makes 2,500 Stampings a Day or More Than Four a Minute—Pressed Cap Said to Be Superior to Cast Owing to Finer Grain of the Resulting Metal

Illustrating the large press used by the Dodge Bros. in turning out the stampings from which the finished hub caps are made for the Dodge cars. Note the standard shop cans in which the finished stampings are placed after they are removed from the machine

SEVENTEEN operations are necessary to complete the work on a hub cap, and in order to cut the time to the limit on this work the Dodge Bros. have installed a machine in their Detroit plant which has a capacity of 2,500 hub caps a day. This machine is for the purpose of forming the rough shape from which the finished hub caps are made. It is a huge punch press and is only employed on the hub cap for the front wheels.

This punching operation is the only punching job necessary in the manufacture of the hub caps, the other sixteen operations being divided as follows: Drawing operations, eight; machining jobs, eight. The punching work is, of course, one in which a great amount of power is required and on the press shown in the accompanying illustration a pressure of over 750 tons is exerted. This power is derived from an independent electric motor which stores up the energy in an enormous flywheel shown at the right of the machine. The men work in pairs, one taking care of the work itself, that is, placing the stock under the die and removing same after pressing, while the other stops and starts the machine.

The finished hub caps, as far as the pressing operation is concerned, are placed into standard cans and forwarded to the machine shop where they pass through a series of progressive operations until they finally make their way into the parts stockroom where they are drawn upon for work in the final assembly of the car.

Results with the pressed hub cap are much better than with those gained by the casting method, being of finer grained material and hence more adaptable to the stresses put upon them in replacing and removing. With this large machine 250 stampings can be made every hour. This is, therefore, an operation in which the skill of the workman, in placing the raw material under the die and removing it quickly while inserting the next, is of great importance. The illustration shows the continuity of the work, the operator placing one stamping into the cans while the next one is undergoing the operation by the die. The speed at which this work is done can be realized when it is known that the machine turns out more than four a minute. The actual operation including the time of stopping and starting the machine taking less than 15 seconds for each stamping.

The cans into which the finished stampings are placed can be readily transported from the punch press to the machines upon which the other operations are performed. They can be placed upon small hand trucks with but little effort and wheeled into position.

The Automobile

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The Service Convention

SCARCELY anything in connection with the automobile industry has been more abused than the term service, with the possible exception of salesmen trying to sell cars entirely on high-gear performances on hills. The high-gear evil is pretty strongly entrenched, so is the service one, but the meeting of service managers for two days last week points to an early elimination of a few of the more impossible evils of service as interpreted by salesmen and short-sighted dealers, as well as a few injudicious makers.

Makers, dealers and owners are slowly but surely coming to the conclusion that service does not mean giving something for nothing, or, getting something for nothing. The concern building on such a foundation has only troubles ahead. Service has been better defined as making it easier to own and maintain an automobile, not that you get presents from the maker or dealer in the form of free inspections, free adjustments, free replacements, and cuts in your repair bills; but rather service is prompt attention, courteous treatment and accurate workmanship with reasonable charges.

When we travel across the country on a limited train we expect service, but this does not mean getting our ticket at a reduced rate; getting free exchange of an upper for a lower berth; or having a discount on all dining-car meals; rather service, there, means attention when it is needed, prompt dining-room service; clean cars, clean berth linen, traveling on schedule and many other details that go to making your trip easy and pleasant.

In our modern hotels we expect service, service which we unquestionably pay for in the daily hotel rate or in dining-room charges. In this connection service might be defined as getting what we pay for and getting it without asking and having to go to considerable trouble to obtain.

Service managers first have to remove the beam from the eyes of their own selling forces before trying to extract the mote from the eyes of automobile purchasers. The evil has largely started with the seller, not the buyer.

Whither?

WHILE we are talking about finality in design and the complete standardization of automobiles, it is noticeable that there is a growing feeling of doubt among the engineers and the manufacturers who have been responsible for development up to the present time. This questioning attitude was very much apparent on the S. A. E. lake trip even in the tone of general discussion, while it was much more pronounced when a few men talked quietly together.

The truth of the matter is that few manufacturers are quite so satisfied with their cars as they would like to be; they are much less satisfied than they expected to be when looking forward to 1915 from a couple of years ago. Yet just what this lack of content is would be difficult to say in a few words.

Uppermost in the minds of many is the idea so well brought out in the discussion in A. L. Brush's paper dealing with motor design, namely that in obtaining wonderful high-gear performance, by using a large engine and a low gear ratio, the correlative disadvantages of rapid wear of motor parts and poor economy of fuel have been introduced. That the American public demands so much greater high-gear power than the user of cars in any other country is largely the fault of the manufacturers, who have for many years done almost all they could to discourage gear shifting. It seems that some of them are realizing that their action has digged a pit and the industry is now at the bottom of it.

The whole situation is indefinite, but it is unquestionable that there has been a great change in the mental attitude of the industry during the last 12 months. It may presage nothing or it may forecast illimitable things.

At the moment it would be altogether too speculative to attempt to sum up the general trend of thought, but one thing stands out clearly and this is that we are to see many attempts to give the same performance by virtue of lighter weights and smaller motors. Weight is the great cry just now, and many an engineer is deep in consideration of what his chassis can do without. But it is thought that this is only a stage, and there are reasons for the belief that instead of being at the end of automobile development we are merely about to enter upon a new phase that may be more interesting and more important than any which have gone before.

U. S. Tire Passes Dividend

Quarterly Dividend of 1 1-2 Per Cent on Common Stock Passed—Stock Drops

NEW YORK CITY, July 3—Much speculation has been caused by the fact that the United States Rubber Co. passed its usual quarterly dividend of 1½ per cent on common stock this week. Since 1911 dividends have been paid on the common stock, of which there is outstanding $36,000,000. In 1911, 1 per cent dividend was paid; in 1912, 4 per cent, and since 1913, a quarterly dividend of 1½ per cent. Some difficulties were anticipated by stockholders when the stock dropped 13 points recently and at this time it was rumored that the usual dividend might not be forthcoming. Stock quotations dropped somewhat as a result.

The only reasons given by the company for passing the dividend are those contained in a statement from President Samuel P. Colt. He says that the net earnings so far this year are substantially the same as last year, but that the unexpected continuation of the war has made it necessary to maintain an unusually strong financial position, and that the war also makes it necessary to carry a larger supply of crude rubber than would be carried at normal periods.

In connection with the crude rubber situation, it is known that the United States Rubber Co. owns some rubber plantations in Sumatra, and it is rumored in rubber circles that crude has been costing the United States company more than some other companies, no allusion to which, however, is made by President Colt. It is understood that earnings were taken from the quick capital to care for these plantations.

Winton Will Stick to Sixes

CLEVELAND, O., July 3—The Winton Co. states that a new model of the 48 six will be brought out shortly before the New York show; there will be no reduction in the price, which is $3,250. The 33 hp. "New-size" six at $2,285 will be manufactured without change until next year. The Winton company expresses its intention of continuing to build sixes exclusively.

New Cole Six at $2,385

INDIANAPOLIS, IND., July 3—The Cole Motor Car Co., has brought out an improved new large six-cylinder car known as model 666. It is a seven-passenger design on a 136-in. wheelbase and includes many refinements which make for comfort and easy riding. It is fitted with deep upholstery and is handsomely finished.

It is in the body work that this car is most distinctive. It has a straight line effect with flat cowl and rounded radiator and long straight hood. The two extra seats are more than usually comfortable due to the additional foot room made by providing space under the front seats. There is a center cowl between the front and rear compartments, and in this there are two lockers for gloves, goggles, etc. A tonneau light is provided, a dash and service lamp and a Waltham clock. While the eight is still the leader of the Cole line, this six is provided for those who prefer this type of motor. The car is mounted on practically the same chassis as this year, the motor being a 4¼ by 5¼, L-head design with the cylinders in pairs. The price is $2,385 f.o.b. factory.

Chalmers Continues Three Models —Prices Lower

DETROIT, MICH., July 6—For 1916 the Chalmers Motor Co. will continue its present models, excepting that they will be greatly improved in many directions and will all sell at lower prices.

There will be three models, the 6-40, at $1,275, being the improved model 32 of this year, which sold at $1,400; the 6-48 at $1,550 which is the continuation of the light six which this season sold at $1,725 and the Master Six, reduced to $2,175, or $225 less than this year.

All of these models are continued because the Chalmers company found that they had met with an ever-increasing demand, and believes that by continuing them with even better and more refined bodies and many other minor improvements and by greatly increasing the production, thus making a reduction in price well possible, that it will best serve both the public and itself.

All Chalmers dealers were consulted as to the 1916 models to be, and 90 per cent expressed the wish that this year's models be continued with improvements wherever possible.

Stutz Adds a New Model

INDIANAPOLIS, IND., July 6—Under the name of the Bulldog Special the Stutz company has added a new model to its line. This is a four-passenger design like the Bulldog which has been described in THE AUTOMOBILE, but whereas the former model has a wheelbase of 120 in. the new model has 130. It differs from the shorter car also in that the front seats are not divided. There is a center cowl and in the back of this there is room for storage in compartments provided. Thermos bottles are furnished as regular equipment. The car is manufactured for the four-cylinder chassis, the motor being 4¾ by 5½.

Franklin Makes $200 Price Cut

Aluminum Substituted for Iron Reduces Weight 75 Pounds Below Last Year

SYRACUSE, N. Y., July 6—The new Franklin series which has just been brought out while showing a number of detail changes, does not make any departures from what has come to be accepted as standard Franklin practice. Such fundamental details as air cooling, laminated wood frames and full elliptic springs both front and rear are features which have come to be looked for year after year in Franklin practice.

The new model does show one radical change, however, which is in the substantial drop in prices. Instead of being $2,150, the new car sells for $1,950 or $200 lower. In both the body and chassis a number of small refinements will be noted. The Franklin claim of lightness has been accentuated to the extent of 75 lb. by the use of aluminum instead of steel in several of the important parts of the power plant and running gear. The fenders are now aluminum as are the air jackets around the cylinders and the valve housing. The gear shifter lever has been moved forward 4 in. in order to allow passengers entering from the left to step behind it. The tire pump mounting has been changed and instead of driving directly from the generator shaft as for the last model it is now connected by reduction gearing. This was done because the generator is geared up to such an extent that the motor had to be run very slowly in order to afford proper pump action. It can now be run at its normal speed without any danger to the pump.

The body is now made without striping or molding and its simplicity is accentuated by placing the horn under the hood. One of the comfort features is the setting of the seats more deeply and, for beauty of design, greater cleanness has been secured by removing the handle from the hood and attaining a form which corresponds more closely to the streamline. The standard color is green with russet wheels.

The Franklin motor is a 3⅝ by 4 valve-in-head design with the cylinders cast singly. It is featured by its seven-bearing crankshaft, helically-driven camshaft, single ignition with Eisemann magneto and Dyneto starting and lighting. The clutch is a disk, the gearset a three-speed selective mounted amidships and the final reduction 3.7 to 1 in the rear axle. The wheelbase is 120 inches, the tires 34 by 4½ and the wheels, wood. Throughout the entire car, lightness of design has been made a feature.

Simplex Takes Over Crane Co.

Will Build Crane-Simplex Model and Continue Others—Crane Second V. P.

NEW YORK CITY, July 7—The Simplex Automobile Co., of New Brunswick, N. J., has bought out the entire plant, assets and good will of the Crane Motor Car Co., Bayonne, N. J., according to reports given out to-day. Henry M. Crane, former president of the Crane Motor Car Co., is now second vice-president of the Simplex company, and is taking direct charge of the engineering work at the New Brunswick plant with R. B. Wasson as factory manager.

The Simplex company will continue the models made for 1915 but will build in addition a new model which is practically identical with the Crane model 4. This will be known as the Crane model Simplex and is intended for those who desire extremely careful workmanship, regardless of the price of the car. The exact price has not as yet been fixed. The car will be built with a wheelbase of 143½ in. and a body space of 112½ in. The tire equipment will be 36 by 4½ forward and 37 by 5 rear. The motor is a six with 4⅜ bore and 6¼ stroke with the cylinders cast in two blocks of three. A rigid crankshaft 2¾ in. in diameter is one of the features of the motor. The carbureter is a Newcomb-Crane and the camshaft, magneto, starting motor, lighting generator, water and tire pump are all operated through silent chains. Steering is left with center control.

The Crane Motor Car Co. has been known to motorists in the East as a concern devoted to the building of high-priced cars, largely to order, although the car was made in standard models. The model 4, chassis alone, listed at $8,000, and it was built with a view of providing the last word in automobile luxury and finish. The bodies for this chassis were generally made by the large body makers to suit the special requirements of the purchaser with the result that the finished cars were among the highest-priced products in America.

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Hendee May Buy Pope Plant

HARTFORD, CONN., July 2—It is stated here on good authority that the Hendee Mfg. Co. of Springfield, Mass., is considering the purchase of the Westfield, Mass. plant of the Pope Mfg. Co. now operated under a receivership. If the property is not disposed of before July 20 it will be sold at public auction by the Pope receivers at the Westfield offices of the company. Every bidder will be required to deposit a certified check for $25,000 on some national bank in New York before the opening of the sale. The Pope company has been ordered by the United States district court at Boston to dispose of the property for a price not less than $725,000. This amount has been offered by H. Preston Cousens who represents a New York syndicate. Acquisition by the Hendee interests is taken to imply resumption of operations at Westfield on a larger scale than ever.

—

Jackson Will Have Two Eights and a Four for 1916

JACKSON, MICH., July 7—While full specifications have not as yet been decided upon, the Jackson Automobile Co. of this city, is bringing out two eight-cylinder models which will soon be passing through the plant in active production. The four-cylinder car will be continued.

—

Elgin to Make Van Speedometer

ELGIN, ILL., July 7—The Elgin National Watch Co., of this city, one of the large watch makers, has just closed negotiations with the Van Sicklen Co., Aurora, Ill., to manufacture the Van speedometer which has been on the market for more than a year, and which is now used on seven cars as standard equipment. The Van Sicklen Co. has been under the direction of N. H. Van Sicklen, Sr., who for years was publisher of *Motor Age*, Chicago.

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Auburn Markets Four and Six

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Two-Speed Axle Decision

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It is shown in the review of the case by the court that Cadillac in its negotiations with the Austin company received a two-speed Austin axle which it later returned to the Austin factory and after which time the Cadillac company brought out its own design of two-speed axle, which was used in its cars and which design has been declared an infringement. The court after minutely describing the Austin axle and the infringing Cadillac axle declares that while some of the details of design differ yet the basic features are the same and that Cadillac infringes claim No. 10 of the Austin patent.

The Cadillac defense insisted that according to this claim the Austin device referred to an arrangement of bevels, gears and clutching devices in the axle, and that it was limited to this particular method of clutching, but the court held otherwise and decided, "We shall not read into one claim elements which expressly characterize another, by which alone the two substantially differ and which are not necessary to make it operative; and that if Austin's only real invention resided in his peculiar clutch mechanisms claim 10 would be void, because broader than the invention."

This part of the court decision refers to the fact that in the Cadillac design the two pinions on the continuation of the propeller shaft are both mounted on sleeves loose on the shaft but capable of being clutched thereto, whereas in the Austin axle while the arrangement of the pinions is the same the smaller pinion on the rear end of the shaft is solid to the shaft and the forward one capable of being clutched to the shaft. In this connection the court has held that Austin's patent is broader than one covering any particular type or scheme of clutching and that the inventive feature of his

U. S. Tire Passes Dividend

Quarterly Dividend of 1 1-2 Per Cent on Common Stock Passed—Stock Drops

NEW YORK CITY, July 3—Much speculation has been caused by the fact that the United States Rubber Co. passed its usual quarterly dividend of 1½ per cent on common stock this week. Since 1911 dividends have been paid on the common stock, of which there is outstanding $36,000,000. In 1911, 1 per cent dividend was paid; in 1912, 4 per cent, and since 1913, a quarterly dividend of 1½ per cent. Some difficulties were anticipated by stockholders when the stock dropped 13 points recently and at this time it was rumored that the usual dividend might not be forthcoming. Stock quotations dropped somewhat as a result.

The only reasons given by the company for passing the dividend are those contained in a statement from President Samuel P. Colt. He says that the net earnings so far this year are substantially the same as last year, but that the unexpected continuation of the war has made it necessary to maintain an unusually strong financial position, and that the war also makes it necessary to carry a larger supply of crude rubber than would be carried at normal periods.

In connection with the crude rubber situation, it is known that the United States Rubber Co. owns some rubber plantations in Sumatra, and it is rumored in rubber circles that crude has been costing the United States company more than some other companies, no allusion to which, however, is made by President Colt. It is understood that earnings were taken from the quick capital to care for these plantations.

Winton Will Stick to Sixes

CLEVELAND, O., July 3—The Winton Co. states that a new model of the 48 six will be brought out shortly before the New York show; there will be no reduction in the price, which is $3,250. The 33 hp. "New-size" six at $2,285 will be manufactured without change until next year. The Winton company expresses its intention of continuing to build sixes exclusively.

New Cole Six at $2,385

INDIANAPOLIS, IND., July 3—The Cole Motor Car Co., has brought out an improved new large six-cylinder car known as model 666. It is a seven-passenger design on a 136-in. wheelbase and includes many refinements which make for comfort and easy riding. It is fitted with deep upholstery and is handsomely finished.

It is in the body work that this car is most distinctive. It has a straight line effect with flat cowl and rounded radiator and long straight hood. The two extra seats are more than usually comfortable due to the additional foot room made by providing space under the front seats. There is a center cowl between the front and rear compartments, and in this there are two lockers for gloves, goggles, etc. A tonneau light is provided, a dash and service lamp and a Waltham clock. While the eight is still the leader of the Cole line, this six is provided for those who prefer this type of motor. The car is mounted on practically the same chassis as this year, the motor being a 4¼ by 5¼, L-head design with the cylinders in pairs. The price is $2,385 f.o.b. factory.

Chalmers Continues Three Models —Prices Lower

DETROIT, MICH., July 6—For 1916 the Chalmers Motor Co. will continue its present models, excepting that they will be greatly improved in many directions and will all sell at lower prices.

There will be three models, the 6-40, at $1,275, being the improved model 32 of this year, which sold at $1,400; the 6-48 at $1,550 which is the continuation of the light six which this season sold at $1,725 and the Master Six, reduced to $2,175, or $225 less than this year.

All of these models are continued because the Chalmers company found that they had met with an ever-increasing demand, and believes that by continuing them with even better and more refined bodies and many other minor improvements and by greatly increasing the production, thus making a reduction in price well possible, that it will best serve both the public and itself.

All Chalmers dealers were consulted as to the 1916 models to be, and 90 per cent expressed the wish that this year's models be continued with improvements wherever possible.

Stutz Adds a New Model

INDIANAPOLIS, IND., July 6—Under the name of the Bulldog Special the Stutz company has added a new model to its line. This is a four-passenger design like the Bulldog which has been described in THE AUTOMOBILE, but whereas the former model has a wheelbase of 120 in. the new model has 130. It differs from the shorter car also in that the front seats are not divided. There is a center cowl and in the back of this there is room for storage in compartments provided. Thermos bottles are furnished as regular equipment. The car is manufactured for the four-cylinder chassis, the motor being 4¾ by 5½.

Franklin Makes $200 Price Cut

Aluminum Substituted for Iron Reduces Weight 75 Pounds Below Last Year

SYRACUSE, N. Y., July 6—The new Franklin series which has just been brought out while showing a number of detail changes, does not make any departures from what has come to be accepted as standard Franklin practice. Such fundamental details as air cooling, laminated wood frames and full elliptic springs both front and rear are features which have come to be looked for year after year in Franklin practice.

The new model does show one radical change, however, which is in the substantial drop in prices. Instead of being $2,150, the new car sells for $1,950 or $200 lower. In both the body and chassis a number of small refinements will be noted. The Franklin claim of lightness has been accentuated to the extent of 75 lb. by the use of aluminum instead of steel in several of the important parts of the power plant and running gear. The fenders are now aluminum as are the air jackets around the cylinders and the valve housing. The gear shifter lever has been moved forward 4 in. in order to allow passengers entering from the left to step behind it. The tire pump mounting has been changed and instead of driving directly from the generator shaft as for the last model it is now connected by reduction gearing. This was done because the generator is geared up to such an extent that the motor had to be run very slowly in order to afford proper pump action. It can now be run at its normal speed without any danger to the pump.

The body is now made without striping or molding and its simplicity is accentuated by placing the horn under the hood. One of the comfort features is the setting of the seats more deeply and, for beauty of design, greater cleanness has been secured by removing the handle from the hood and attaining a form which corresponds more closely to the streamline. The standard color is green with russet wheels.

The Franklin motor is a 3⅝ by 4 valve-in-head design with the cylinders cast singly. It is featured by its seven-bearing crankshaft, helically-driven camshaft, single ignition with Eisemann magneto and Dyneto starting and lighting. The clutch is a disk, the gearset a three-speed selective mounted amidships and the final reduction 3.7 to 1 in the rear axle. The wheelbase is 120 inches, the tires 34 by 4½ and the wheels, wood. Throughout the entire car, lightness of design has been made a feature.

Simplex Takes Over Crane Co.

Will Build Crane-Simplex Model and Continue Others—Crane Second V. P.

NEW YORK CITY, July 7—The Simplex Automobile Co., of New Brunswick, N. J., has bought out the entire plant, assets and good will of the Crane Motor Car Co., Bayonne, N. J., according to reports given out to-day. Henry M. Crane, former president of the Crane Motor Car Co., is now second vice-president of the Simplex company, and is taking direct charge of the engineering work at the New Brunswick plant with R. B. Wasson as factory manager.

The Simplex company will continue the models made for 1915 but will build in addition a new model which is practically identical with the Crane model 4. This will be known as the Crane model Simplex and is intended for those who desire extremely careful workmanship, regardless of the price of the car. The exact price has not as yet been fixed. The car will be built with a wheelbase of 143½ in. and a body space of 112½ in. The tire equipment will be 36 by 4½ forward and 37 by 5 rear. The motor is a six with 4⅜ bore and 6¼ stroke with the cylinders cast in two blocks of three. A rigid crankshaft 2¾ in. in diameter is one of the features of the motor. The carbureter is a Newcomb-Crane and the camshaft, magneto, starting motor, lighting generator, water and tire pump are all operated through silent chains. Steering is left with center control.

The Crane Motor Car Co. has been known to motorists in the East as a concern devoted to the building of high-priced cars, largely to order, although the car was made in standard models. The model 4, chassis alone, listed at $8,000, and it was built with a view of providing the last word in automobile luxury and finish. The bodies for this chassis were generally made by the large body makers to suit the special requirements of the purchaser with the result that the finished cars were among the highest-priced products in America.

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Hendee May Buy Pope Plant

HARTFORD, CONN., July 2—It is stated here on good authority that the Hendee Mfg. Co. of Springfield, Mass., is considering the purchase of the Westfield, Mass. plant of the Pope Mfg. Co. now operated under a receivership. If the property is not disposed of before July 20 it will be sold at public auction by the Pope receivers at the Westfield offices of the company. Every bidder will be required to deposit a certified check for $25,000 on some national bank in New York before the opening of the sale. The Pope company has been ordered by the United States district court at Boston to dispose of the property for a price not less than $725,000. This amount has been offered by H. Preston Cousens who represents a New York syndicate. Acquisition by the Hendee interests is taken to imply resumption of operations at Westfield on a larger scale than ever.

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Jackson Will Have Two Eights and a Four for 1916

JACKSON, MICH., July 7—While full specifications have not as yet been decided upon, the Jackson Automobile Co. of this city, is bringing out two eight-cylinder models which will soon be passing through the plant in active production. The four-cylinder car will be continued.

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Elgin to Make Van Speedometer

ELGIN, ILL., July 7—The Elgin National Watch Co., of this city, one of the large watch makers, has just closed negotiations with the Van Sicklen Co., Aurora, Ill., to manufacture the Van speedometer which has been on the market for more than a year, and which is now used on seven cars as standard equipment. The Van Sicklen Co. has been under the direction of N. H. Van Sicklen, Sr., who for years was publisher of *Motor Age*, Chicago.

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The Cadillac defense insisted that according to this claim the Austin device referred to an arrangement of bevels, gears and clutching devices in the axle, and that it was limited to this particular method of clutching, but the court held otherwise and decided, "We shall not read into one claim elements which expressly characterize another, by which alone the two substantially differ and which are not necessary to make it operative; and that if Austin's only real invention resided in his peculiar clutch mechanisms claim 10 would be void, because broader than the invention."

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device is in the arrangement of a double pair of bevel pinions and gears, the higher gear ratios being outside in the group and the lower gear ratios inside. In the Cadillac the two large bevels are bolted together, whereas in the Austin axle they are separate gears capable of being separately clutched to the shaft, but yet this difference of detail working out of the scheme does not conflict with the basic features of Austin's claims.

In this connection the court held that Cadillac had a legitimate right to develop any design of two-speed axle, using whatever clutching schemes may be deemed best providing it does not infringe the Austin claim of relative arrangement of the two sets of pinions and bevels coupled with clutching devices.

The court held that previous examples of multi-speed axles did not conflict with the Austin patent because the cases cited were not in the precise field filled by the Austin patent. The Minerva patent is cited, but it is shown that its scope was that of combining a gearbox with a rear axle and that the several speeds were for this purpose, whereas in the Austin patent the two-speed axle was intended to be used with a conventional gearbox as used on motor cars to-day.

Austin's Combination

The court holds that in spite of earlier efforts along perhaps closely allied lines, that Austin's efforts involve inventive genius as compared with Minerva, which is looked upon as probably an impractical construction. In this connection the court says: "It is true that each of these missing elements can be found in some one of the prior patents; but this is not enough to negative invention. If the selection of elements from existing machines into a complete combination has, for the first time, produced, from a practical and commercial aspect, a new result, invention may well be predicated thereon; and if producing more of a woven fabric within a stated time was a 'new result' within the meaning of this familiar rule (Higgins vs. Loom Co.), so must be the additional mileage per gallon of gasoline, the saving of wear and the additional ease of riding, all of which the Cadillac company so strongly attributed to the two-speed axle."

Austin's Renewal

In referring to that part of the argument between Austin and Cadillac in which Austin was expecting to get broader claims on his axle after it had been shown to the Cadillac company, and the possibility of obtaining such claims was discounted by the Cadillac company the court holds:

"There is no doubt that Austin at first regarded his relative arrangement of gears and clutches as characteristic of his invention, both according to the specifications and claims allowed on his original invention. The idea of one fixed member and one clutch member upon the shaft and one of each on the axle was inherent in all these. . . . The defendant's device does not infringe these claims. . . . Austin took further counsel, abandoned his application and filed another in renewal and on this new application he secured claim 10. . . . Very likely the necessity for these new claims was brought to Austin's mind by his dealings with Cadillac; and by observing the Cadillac design. . . . Austin's original failure to claim a certain gear arrangement in connection with his clutching scheme, ought not on any principle prevent him from claiming it as soon as the propriety of doing so occurred to him. . . . The fact that this feature (high-gear ratio set of pinion and bevel out of the low-gear ratio set of pinion and bevel) was regarded by Austin as his chief advance and that he so presented it to Cadillac, and that Austin notified Cadillac that he expected to get better claims in this respect."

The amount of damages which Austin will collect, in the event a rehearing is not granted cannot be determined until the usual routine of accounting has been carried out.

Empire Six Price $1095

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Motor Develops 46 Hp. at 2200 R.P.M.—Unit Power Plant and Floating Rear Axle

INDIANAPOLIS, IND., July 3.—Closely following the announcement that the Empire Automobile Co. would move its factory from Connersville to Indianapolis, comes the announcement of the latest addition to the Empire line. This is a six to sell at $1095 and marks the entrance into this field of a concern which has heretofore confined its efforts to fours.

The chassis includes a unit power-plant with cone clutch, three-speed gearbox and floating axle. The wheelbase is 120 in.

The 3 by 5-in. block model motor is said to develop 46 hp. at 2200 r.p.m.. The crankshaft is carried on three bearings lined with babbitt in bronze shells. The camshaft runs in oil. The main lubricating system consists of a constant-level splash outfit in which the oil is circulated by a plunger pump. The water pump is a centrifugal design and cooling is assisted by a pressed steel fan mounted on ball bearings.

The Stewart vacuum system is used for feeding gasoline to a Schebler carbureter. Ignition is by a battery system, employing the Connecticut automatic distributor. The electric starting and lighting is provided by an Auto-Lite outfit, working through a Bendix drive and employing a Willard 12-volt battery.

The cone clutch is housed in a bell extension of the crankcase to which the three-speed gearbox is attached. The gearset shafts are carried on New Departure ball bearings and the drive is taken from the gearset to Hartford universal joint and propeller shaft to the floating axle. Alloy steel gears and shafts are employed in this axle and the housing is pressed steel with a removable inspection cap at the rear.

The brake drums are carried on the rear wheels, which are artillery type and fitted for 34 by 4-in. tires. The brakes are equalized and are provided with simple adjustments. The wheels are fitted with either Firestone or Goodyear tires of standard equipment, non-skid being provided on the rear and an extra demountable rim being part of the standard equipment. The holder for the extra rim with its inflated tire is built integrally with the chassis upon an extension at the rear of the frame, and but one felloe band is required to carry two tires. No straps are employed.

The body incorporates a long cowl and convex sides. The front seats are divided and the doors are large. The engine hood merges into the body line without a break, tapering back from the high racing-type radiator. The upholstery is genuine leather and equipment including a Fabricoid top is complete.

Production on this car will be carried on in the Indianapolis plant of the Empire company. In this building there are 150,000 sq. ft. of floor space available for manufacturing. It is estimated that 250 skilled workmen will be employed at the time the plant is opened on July 6.

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Morse Announces 1916 Car

PITTSBURGH, PA., July 3—Under the name of the Morse light car the Morse Cyclecar Co., of this city has announced its 1916 product. This is a two-cylinder V-type design with a two-speed gearbox and a tandem seating arrangement adapted for two people. The wheelbase is 105 in. and the tread 36 in. The tires are studded 28 by 3 in. and the wheels wire. The car is driven through the front axle by means of a chain from the change-speed mechanism just back of the motor which is mounted in the customary position under a hood. The price with standard equipment is $350.

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Kalamazoo Co. Changes Name

KALAMAZOO, MICH., July 2—The name of the Kalamazoo Motor Vehicle Co. has been changed to that of Columbia Motor Truck & Trailer Co.

Ford Co. to Make Its Own Tires

1917 Cars Will Be Equipped with First of Annual Product of 2,000,000 Casings

DETROIT, MICH., July 6—The Ford Motor Co., according to an announcement by Henry Ford, will begin manufacturing its own tires which should be ready for the 1917 cars. The new tire plant will be a part of the new manufacturing center to be built for the Ford tractor. The output of tires is placed at 2,000,000 for the first year, and the $5 per day schedule will apply to all workers at the new plant, it being estimated that by 1917, 50,000 to 60,000 men will be employed by the Ford company.

Jones Six Continued for 1916

WICHITA, KAN., July 5—The Jones Motor Car Co., this city, has brought out its 1916 product which is in the form of a six-cylinder assembled car containing such well-known units as the Rutenber motor, Stromberg carbureter, Warner steering gear, Detroit gearset, Warner vacuum feed, etc. Starting and lighting equipment is furnished by Gray & Davis, Inc.

The price of the car has not as yet been stated but some of the specifications of importance include an L-head block 3 by 5 motor of six cylinders and three bearing crankshaft. The wheelbase is 118 in.

Fostoria Light Car Co. Formed

FOSTORIA, OHIO, July 2—The Fostoria Light Car Co., has been incorporated with $100,000 capital stock. The company will bring out a light car at a popular price. The incorporators of the company are: R. J. Ridgway, J. H. Jones, Ira Cadwallader, Charles Ash, of Fostoria, and A. C. George of Lima.

Packard, Advance-Toledo Pump Equipped

NEW YORK CITY, July 3—The Packard Motor Car Co. will equip its cars with the Advance-Toledo motor driven tire pump. The Monarch Motor Car Co. recently added this pump to its equipment on its eight.

Every Sixth Family in Kansas an Automobile Owner

TOPEKA, KAN., July 3—There is an automobile for every sixth family in Kansas, according to J. T. Botkin, Secretary of State. When the license books were closed there were 59,477 automobile licenses in the State. This is one for every 28.3 persons. The ordinary average is five persons to a family so that every sixth family in the entire State has an automobile under population figures. The estimated cost of the cars is around $60,000,000.

Kansas spent over $20,000,000 for cars last year. There were 39,889 cars licensed in June, 1914. The increase has been almost 20,000 cars in the twelve months.

100-M.P.H. Record for 5 Miles

OMAHA, NEB., July 7—*Special Telegram*—Orr, in his Maxwell, made 5 miles in 3 min., or 100 m.p.h., in the 300-mile race held on the new 1¼-mile board speedway here Monday, thus establishing a new mark for that distance, the best previous record having been made by Bragg in a Fiat on the Los Angeles board track, in 3:11.75, May 5, 1912.

Buick's Record Payroll

FLINT, MICH., July 3—For the last two weeks the pay-roll of the Buick Motor Co. was in excess of $223,000, which established a new record for this time of the season.

Studebaker Insures Employees

DETROIT, MICH., July 6—An arrangement was completed a few days ago between the Studebaker Corp. and the Equitable Life Insurance Society of the United States, New York, whereby 6500 of the 13,000 workmen now employed by the corporation are insured for life while the remainder will also be insured in the same way within a short time. No matter how long the Studebaker workman has been with the concern, through the deal with the insurance company he will have the benefit of a life insurance.

Packard Gets Prize at Fair

SAN FRANCISCO, CAL., July 2—The Grand Prize of the Panama-Pacific Exposition for excellence in the field of automobile manufacture has been awarded the Packard Motor Car Co., of Detroit. Fifteen gold medals were distributed in the transportation division and among those who received prizes were Pierce, Cadillac, Ford and Rolls-Royce.

McClurg Rubber Elects Officers

COSHOCTON, OHIO, July 3—The McClurg Rubber Co., recently organized to manufacture tires, has elected the following directors: J. S. McClurg, C. M. Christenson, H. T. Forrest, J. L. McClurg and W. Z. Davis. The directors then elected the following officers: President and general manager, J. S. McClurg; vice-president, C. M. Christenson; and secretary and treasurer, H. T. Forrest. The company expects to be operating by July 1.

Overland Builds in St. Paul

Contract for $250,000 Building Closed for Combined Service Station and Warehouse

ST. PAUL, MINN., July 6—A contract for several acres of land has been closed in this city for the erection of a $250,000 warehouse by the Willys-Overland Co. The plant will combine the facilities of a warehouse and an assembling station, according to present indications. St. Paul is considered as an excellent distributing point for the northwestern territory as the shipping facilities by rail and water are unsurpassed.

Overland Plant in Minneapolis?

MINNEAPOLIS, MINN., July 3—The Willys-Overland Co. has been negotiating for the purchase of a 18-acre site in this city for the purpose, it is said, of establishing a plant in the future.

Allen Dealers Convene

FOSTORIA, OHIO, July 1—Tuesday and Wednesday of last week the distributors of the Allen Motor Co., makers of the Allen cars, held a convention and general get-together party. The 1916 Allen car was exhibited to the dealers who attended a general meeting Tuesday afternoon, when the new car was lectured upon by the factory officers and engineers. Tuesday night the guests of the factory were banqueted and Wednesday the party was taken to Bucyrus, where the factory making the motors and gearsets for the cars was visited.

Hans Co. Now National Gauge & Equipment Co.

LA CROSSE, WIS., July 3—The Hans Motor Equipment Co., Las Crosse, has been reincorporated with a capital of $200,000 under the name of the National Gauge & Equipment Co., by D. G. MacMillan, P. M. Gelatt and J. M. La Vaque. The new company is issuing a new advance bulletin which gives a brief description of the complete line of pressure gauges which it manufactures.

2-Mile Board Track for Kansas City

CHICAGO, ILL., July 3—Twenty residents of Kansas City, Mo., who are engaged in the promotion of a company to build a speedway in their city, were in Chicago recently to witness the 500-mile race and study the construction of the local board track. The expedition was under the auspices of the mid-continent expedition association which plans to build a 2-mile automobile track of

wood at the official stopping place of the transcontinental balloon races and at a strategic point on the national old trails highway.

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Erskine Slated for Studebaker Head

NEW YORK CITY, July 7—A. R. Erskine is slated for the Studebaker Corp. presidency, the election to take place tomorrow at a meeting of the directors in this city. The stockholders met to-day in Jersey City and elected the directors to act on a provision for the classification of the directors into five classes of equal number and for the election of one of said classes in each year hereafter.

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Hayes Wheel Enlarges

ALBION, MICH., July 3—The Hayes Wheel Co. of this city, which makes the hubs for the wheels made by the parent plant, the Hayes Wheel Co., in Jackson, will erect a new plant to be ready for occupancy September 1. When completed the company will employ 200 men here, or double its present working force, and the production will be more than doubled. Machinery valued at $15,000 has already been purchased and by the time the new building is ready it is expected that from $50,000 to $60,000 will have been spent.

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English Motor Works Burned

LONDON, ENGLAND, June 29—Fire recently did $500,000 damage to the motor works of Brian Hughes & Strachan at Park Royal. The buildings covered 3 acres and contained 100 Red Cross motor ambulances and 200 army motor vans. The vehicles, which were ready for delivery to the government, were destroyed.

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McNaull Tire Opens Branch

ST. LOUIS, MO., July 3—The McNaull Auto Tire Co., Toledo, O., has opened a branch here at 5032 Delmar boulevard. The local office has been organized as the McNaull Tire Co. of St. Louis.

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Automobiles for Topeka R. F. D.

TOPEKA, KAN., July 3—Motor service has been installed on two rural routes out of Topeka. Two men who owned automobiles were appointed to be the first mail carriers using motor cars in Topeka.

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Apco Accessory Prices Reduced

PROVIDENCE, R. I., July 3—The Auto Parts Co., Providence, R. I., manufacturer of the Apco line of specialties for the Ford car, announces a reduction in the list price of its muffler cut-out and valve stem adjusters. The last named now retail for 20 cents the set and the muffler cut-out at 45 cents each.

New Kissel 1,000 lb. Truck

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Is Shaft Driven—Capacities of Line Readjusted—1 1-2 Tonner Reduced $100

HARTFORD, WIS., July 1—Shaft drive has been extended in the product of the Kissel Motor Car Co., Hartford, Wis., to embrace one more capacity in its line of ½, 1½, 2, 3, 4, and 6-ton vehicles, just announced. The capacities of the Kissel model have been somewhat readjusted, the 1000-lb. vehicle being a new model which has been promised for some months. The 1-ton model rated at ¾ for 1 ton is the 1500-pounder announced for 1915. The 1½-ton model is the 1 tonner of 1915 rated for 1916 at 1 to 1½ tons. The 2-tonner, rated at 1½ to 2 tons, takes the place of the discontinued chain-driven 1½-ton. The 1915 2½-tonner is continued with chain drive with a rating of 2½ to 3 tons. The 3½-tonner has 3½ to 4 tons and the 6-tonner without change.

Structurally the new 1000-pounder does not differ from the other shaft-driven models except that the final drive is through bevel gears instead of worm gears. It is designed for pneumatic tires as are the 1 and 1½-ton models and lists at $950 for the chassis. The ¾ to 1-tonner lists at $1,500; the 1 to 1½-tonner has been reduced from $1,850 to $1,750; the new worm-driven 1½ to 2-tonner is priced at $2,100, the same as the 1½-ton chain-driven model. No other changes in price have been made. The 2½ to 3-tonner listing at $2,750, the 3½ to 4 at $3,350 and the 6-ton model at $4,350. All Kissel trucks have pressed steel frames and motors located under conventional hoods. All shaft-driven models have unit power plants, those with chain drive having the gearset incorporated with the jackshaft. Left steer and center control are employed on all models. The characteristic cellular radiator is used throughout the line. Only the chain-driven models are fitted with a differential lock. Timken and Timken-David Brown axle equipment is a consistent feature of the line.

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McKinney with Champion Plug

NEW YORK CITY, July 3—E. C. McKinney, formerly with Splitdorf, has joined the sales force of the Champion Spark Plug Co., Toledo, and will represent it in Texas, Louisiana, Arkansas and New Mexico.

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Mich. Buggy Refuses $50,000 Offer

KALAMAZOO, MICH., July 3—An offer for $50,000 for the plant of the former Michigan Buggy Co.'s plant and property has been turned down by the Michigan Mfg. Realty Co. which wants $60,000. The offer was made by Attorney C. A. Burras, of Chicago, acting for those interested in a new automobile manufacturing concern now being organized. It was stated that the men behind the new enterprise have plenty of capital and that the company will be finally organized and incorporated in the state in which the plant will be located. The matter of a plant has now been taken up with the Cleveland Chamber of Commerce.

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Sheldon Men to Convene

WILKES-BARRE, PA., July 6—Beginning July 14 and continuing for several days, the salesmen of the Sheldon Axle & Spring Co. will be in convention at the plant in this city. Men from both the spring and axle departments will attend. In addition to important redistricting of certain territories, addresses on selling and merchandising and the effect of advertising on the marketing of an output will be made by men who are in close touch with the rapid advance of the Sheldon company in the parts field.

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Motorette Debts Not All Paid

HARTFORD, CONN., July 2—L. A. Howard as receiver for the C. W. Kelsey Mfg. Co. of Hartford, which made three-wheeled vehicles called Motorettes wants money with which to pay the bills of the concern and accordingly appeared before Judge Thomas in the United States court with a motion for authority to assess the stockholders for funds to pay the concern's obligations which amount to more than $20,000 above the assets. A hearing will be given on the motion in the autumn.

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Walpole Petition Denied

BOSTON, MASS., July 3—Judge Dodge in the United States District Court yesterday denied the petition of Maurice G. Sollers, a stockholder in the Walpole Tire & Rubber Co. asking leave to intervene in the case in order that he might appeal from the court's decree ordering the sale of the company's assets and confirming the sale. The petitioner stated that he desired to appeal in behalf of himself and a group of stockholders.

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Dixie Light Car Makes Début

VINCENNES, IND., July 1—The initial product of the Dixie Fiscal Co., Vincennes, Ind., has put in an appearance. It is a light car styled the Dixie and will be made in three models, roadster, touring and speedster. The two former will have standard tread though the speedster will have 36-in. tread. A feature of the car is the use of coil springs.

Service Heads Want Standard Policy

2-Day Detroit Convention of Service Managers Votes to Draft Standard Service Policy—Different Systems for Trucks and Passenger Cars—Salesmen Injure Service—Better Control of Spare Parts to Dealers

DETROIT, MICH., June 30—Further impetus to the movement for a standard service policy was given by the Service Managers' Convention which was in session at the Hotel Statler here today and yesterday. Service men and other officials of motor car and truck plants from all parts of the country were in attendance. Alfred Reeves, general manager of the National Automobile Chamber of Commerce, who presided, said that a wonderful amount of good must undoubtedly come from the gathering, and that it was one of the best of its kind he has ever attended.

To Get Service Policy

A committee was voted to formulate into a standard policy the ideas of the convention as to what should constitute the service the dealer should render the purchaser of a car. It was also voted to recommend to the N. A. C. C. that it start an advertising campaign to aid in telling the owner what he should expect in the way of free service, and also to get to the various local trade organizations along this line.

It was the majority attitude that general repair shops should not be given discounts on parts, this being against the ethics for dealer protection.

Different service policies for passenger cars and trucks were deemed necessary due to the diverging conditions entering into the work of the two classes of vehicles. The need for censoring dealers' parts orders was brought out, this applying especially to the small dealer, whose experience would not make him so good a judge of what parts he should carry as the manufacturer is.

Much discussion of the C.O.D. method of payment for parts ordered was discussed, and most agreed that though it has its drawbacks, it is the best policy to pursue, taken from all angles.

Standard Policy Backbone

That there is need for some form of standard policy on the matter of service which the car owner gets free from the dealer, there was little doubt. As Mr. Reeves put it, a standard policy would be a printed backbone in the hands of the dealer. It would cut out the cut-throat competition on service which is now doing much to ruin dealers' business. In fact, the matter of a service policy was the real cause of the convention, for it was desired to get some expression on the subject from the service men.

Service Pointers

A standard service policy would be a printed backbone in the hands of the dealer. Alfred Reeves, General Manager N. A. C. C.

Four essentials in dealers' service are: Parts, repairs, supervised instruction regarding the car, and cooperation with the owner. Charles Gould, Maxwell.

The hint of buying a new car is often the bait which makes the dealer do more than he should for a car owner. E. W. Cotton, McFarlan.

Installing a vehicle properly after the sale is a legitimate part of the service. J. V. Coy, Peerless.

Road repairmen disrupt organizations, cost money, and make it too easy for customers to get service to which they are not entitled. E. T. Klee, Stutz.

Service does not mean giving something for nothing. A. B. Hanson, Chalmers.

Service is providing all the necessary means for keeping a car running. A. B. Cumner, Autocar.

Dealers' service is often a cut-throat business done to sell cars. H. H. Carpenter, Saxon.

Macauley Favors It

Alvan Macauley, vice-president and general manager of the Packard company, thinks that service and a standard policy are the vital things of the business now. Whether or not the manufacturers get this service matter down to a reasonable basis and hold it there, will largely govern their staying in the business, he said. Dealers have to contend with all sorts of customers, such as women, men trading on their name, etc., and most of these are good bargainers who will get all they can for nothing. As this gratis treatment often eats up the dealer profit, all must get together and have an understanding of what constitutes the service to which the customer is entitled.

A. B. Cumner, service manager Autocar company, believes the time is ripe for such educational campaigns as will acquaint the public as to what service should and would consist of. Mr. Reeves explained that the prime reason for a standard policy is that nearly every dealer handles several makes of cars, and if there is not some standardization in the service he is to render all buyers, he is apt to hold the manufacturer with the best policy up as an example to the others.

E. W. Cotton, secretary McFarlin company, used the words "coerced service" to describe the kind of service which the dealer often is obliged to give under the present conditions. The hint of buying a new car often is the bait which makes a dealer do more than he should for a car owner.

Four Essentials

In establishing what he thinks constitutes service to the owner, Charles Gould, manager of service for the Maxwell company, laid down four main points to which the dealer should pay special attention:

1. Parts; 2. Repairs; 3. Supervised instruction regarding the car; 4. Cooperation with the owner.

In connection with the first of these, a sufficient supply of parts located so as to get them to the customer quickly is very important. Accidents, the lack of oil and grease in the machine, driving and temperamental differences between owner and dealer are not points which should come under the definition of free service. The owner ought to know exactly what gratis service he will get, and before any repairing is done, he ought to be told how much it will cost, if it is possible to tell him. The manufacturer should really be the umpire between the dealer and the owner in the matter of disputes, Mr. Gould believes.

J. B. Coy, technical and service department, Peerless company, said that there should be little variation in the opinions of the delegates on this service matter. Installing a vehicle properly after sale was emphasized by him as a part of service, and further than that the manufacturer should stand on whatever he feels morally obligated to deliver.

The Spoiled Customer

W. H. Doddridge, service manager, the Winton company, pointed out that the

customer has been spoiled in most cases until he expects everything he can get now. Any standardization will have to be flexible, he thinks, so long as owners have different ideas. Much of the imposing on dealers is due to the overworking of such words as booster and big man. These are used by persons trying to get something for nothing from the dealer. Salesmen are also responsible for a lot of service evil, for when selling cars, they imply a great many things that the dealer is unable to do free. They use another overworked phrase, "Leave it to me."

E. T. Klee, service manager, Stutz company, is against the practice of having road repair men, as they disrupt organizations, cost money and make it too easy for the customer to get a lot of service free which he is not entitled to. The dealer should not have a territory so large that he cannot send a repair man at small expense from his own shop.

Salesmen Bad Offenders

Much of the service trouble begins in the sales department in the opinion of A. J. Banta, Chicago branch, Locomobile company, who says that more is given away by the service department in making good the extravagant promises of the sales department than in any other way. Service means everything for nothing with the salesmen.

That the salesman should keep service as far in the background as possible is the view of G. E. Drawe, assistant secretary and treasurer, Pathfinder company, who emphasized the fact that the car buyer is usually a better salesman than the car salesman, else he would not have the money to buy a car. Thus, he sells the car salesman for whatever he wants in the way of free service.

A. B. Hanson, Chalmers service manager, quoted the printed text of his company's idea of service. It is that service does not mean giving something for nothing. It means giving prompt attention at the least possible cost.

Service Defined

Mr. Cumner offered two good definitions. Service, he said, is the providing of all necessary means of keeping a car running, while free service is the taking care of mistakes and conducting an educational campaign.

Educational Service

H. W. Drew, service department Marmon company, pointed out that service is doing as much as possible for the owner at the least possible expense. He thinks a lesson might be drawn from the service rendered by certain of the parts makers, such as storage battery people, electrical equipment makers, etc. Service should be more educational and less individual, Mr. Drew aptly put it. If better information were put into instruction books, and if letters were sent to owners from time to time on the care of various parts of the car, much could be accomplished.

Dealers' Service

The question of whether or not the dealer's service policy should go farther than the manufacturer's warranty was generally answered in the affirmative, it being considered that this warranty refers specially to defective material and workmanship. Then, the dealer's policy refers to a special field and it varies.

It is a ticklish question and one that is hard for the manufacturer to dictate, Mr. Drew said. The successful dealer has devised special methods which apply to his community, and he is naturally more familiar with his clientele than is the manufacturer, and he naturally should radiate on the manufacturer's guarantee. The small and weak dealers are the ones who need an educational campaign the most.

H. H. Carpenter, service manager, Saxon company, thinks the service given by dealers is a cut-throat proposition which is done to sell cars, promising anything to make the deal. He agrees with an educational campaign to make a common ground for all to work upon.

Wants Definite Service

On the other hand, Percy Owen, Chalmers general sales manager, believes in definitely stating what the dealer should do in the way of service. He outlined the policy which his concern is operating upon, explaining the distinction which is made between what is termed t chnical service and shop service or full repair work. The technical service, which takes in thorough inspection and adjustment of the car, is what the dealer is instructed to render free for a stated period. The dealer also absorbs the labor cost on replacement parts which the manufacturer sends free, this within reasonable limits, of course.

Truck salesmen are superior to passenger car salesmen in the opinion of L. L. Virgil, service manager, the Jeffery company, who says that he has no special trouble through salesmen promising more than the factory can do. Before anything can be done on the matter of starting an educational campaign on service, the committee will have to decide on what policy is to be followed, and then this will have to be approved by the head officials of the various companies through the N. A. C. C., Mr. Reeves explained.

Trucks and Cars

Up to a certain point, service policies for passenger cars and trucks can be the same, but the work they have to do and the attitude of the owners are so different that it seems advisable to lay down separate policies for the service treatment of the two classes of cars. This was the gist of the paper which Mr. Macauley read on the subject.

For either class the warranty work is the same. This means the repair work which the manufacturer does gratis for moral reasons. Good-will advertising, conditions of service and requirements dictate separate policies beyond this point. Truck drivers do not have time during business hours to stop and make repairs, while passenger car drivers and chauffeurs have time. Trucks are relatively slow-moving vehicles, and it therefore takes a comparatively longer time to bring them to a service station than it would a passenger car. Further, they are less under the owner's supervision than a passenger car, and they also operate on solid tires. All of these things make the service problem different. The particular policy for service which is laid down is not important. It is the placing of something definite in the salesman's hands that is important, Mr. Macauley said. Let the owner know exactly what to expect.

Representatives of White, Reo, and others who make both cars and trucks said that their policies for the two classes of vehicles differ, generally more leniency being exercised with the trucks.

Censoring Parts Orders

The problems of how the manufacturers can assist in preventing dealers from overstocking and being obliged to return obsolete parts was well handled by C. W. Matheson, director of service for Dodge Brothers, who said that parts orders should be carefully looked into to prevent unnecessary investment and loss to manufacturers through having to redeem obsolete parts later. When a maker contemplates a change, dealers should be advised so as not to put in orders for parts soon to be superseded. He advocates a card ledger system, crediting and debiting it as parts are added or taken out. This is for the dealer. By taking into account the average selling rate of cars in any territory, it is easy to arrive at the average consumption rate of parts, and this procedure should be carried out in connection with orders. Mr. Matheson believes in giving a dealer a time limit of 1 year, after which is becomes optional with the manufacturer to redeem obsolete parts.

R. E. Winans, service manager, Paige company, suggested taking the experience of other dealers in suggesting to new dealers how many parts to carry in proportion to the number of cars.

Obsolete Parts

Summing up the discussion on this topic, is was agreed that the main object

is to supply the consumer, so that nothing should be done that would curtail the quick service on repair parts. There was some sentiment for penalizing the dealer for the lateness of return of superseded parts. That is, discounting them after a certain time. It was also recognized that geographical conditions might make one part more important in one locality than another. It was considered a good thing to use a maximum and minimum scheme, whereby the dealer is required to order more of each part when the number on hand falls to a set minimum. In this case, he requisitions for sufficient to bring the stock of that part up to the pre-determined maximum. He has no choice in the matter. It did not seem necessary for a dealer to carry parts for cars older than two years, such parts coming from the stock at the factory.

Standardized Account

It was brought out by A. H. Ransen, manager parts order department, Studebaker, that inasmuch as the parts order department is a business within itself, there should be a standardized plan for handling the parts accounts with dealers. Among the features should be a deposit to guarantee parts accounts, and a cash discount for prompt settlement. It is primarily a matter of dealer education, also.

Mr. Owen is strongly in favor of a deposit per car order on parts, and believes that a standard form of accounting would assist dealers. He thinks the C.O.D. system a fixture. The keynote was struck by W. D. Smith, Cole service manager, who said that it is particularly essential, since dealers handle different lines of cars.

General Repair Shops

J. A. Harris, Jr., advertising manager, the White company, took the stand in dealing with the subject, Should Manufacturers Encourage General Repair Shops by Selling Them Parts, that the matter of repairing and overhauling will soon become so great in certain localities that the dealer will not be able to handle it all, and therefore outside shops will have to be established. Then care should be taken in shop selection to make sure that they can do the work properly and as quickly as the parent shop.

C. J. Boilon, service manager, Kelly-Springfield truck company, thinks it inadvisable to have repair shops where there is a dealer, as this creates friction. J. F. Plummer, Locomobile company, also believes that dealers should be protected, and therefore is not in favor of discounts to local repair shops in territories covered by dealers. Where there are no dealers, then establishments on a parts selling basis are advisable for the convenience of owners. Several others were practically of this same opinion.

Owner Protection on Replacement

There was little discussion of the paper, How Can the Manufacturer Satisfy Himself That the Dealer Who Receives a Credit Installs the Part in the Customer's Car Without Charge, which was read by Mr. Klee. He outlined a method of having the owner sign a tag which is attached to the part sent back to the factory for replacement. On credit being issued to the dealer, the owner who signed the tag is notified. Several modifications of this method were explained, but they were all along the same line of advising the car owner.

Service Coupons

The matter of issuing service coupon books to customers was brought up, and there was some discussion. Several individual dealers' schemes independent of factories were explained, in addition to a description of the Federal, Chalmers and other factory coupon book plans. It is evident that the scheme admits of many ramifications.

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Muncie Plants Running to Capacity

MUNCIE, IND., July 1—The automobile concerns here are crowded to capacity and some of the companies are turning down orders because of rush business.

The Warner Gear Co. has 1000 men at work in its plant proper and has smaller forces at work in two other factory buildings. The Muncie Gear Co., has all the business it can handle and is employing a large force. All other gear and parts concerns as well as the Inter-State automobile factory are running practically at capacity. All are hunting for additional workmen.

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Federal Tire Repairs Free

MILWAUKEE, WIS., July 3—The Federal Rubber Mfg. Co. of Milwaukee, with works at Cudahy, Milwaukee county, has established a factory branch and service station in the city of Milwaukee, occupying a store and warehouse at 509 Broadway. The announcement signed by H. A. Githens, vice-president, is somewhat unusual with regard to the extent of the service the station will give. It says: "The object of this service station is to provide free service to users of Federal tires. By free service we mean free; that is, removing and applying Federal tires without charge; repairing punctures in Federal tires and tubes without charge, and repairing cuts on Federal tires without charge. This station will be open from 7 a. m. to 11 p. m. daily and Sunday, and free air will be furnished during these hours." The new Federal service does not change the list of jobbers and retailers of Federal goods in Milwaukee.

Briggs Assets Are $751,999.33

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Scheduled List Places Liabilities at $556,424.83—Creditors to Meet July 15

DETROIT, MICH., July 1—The Briggs-Detroiter Co. which was declared bankrupt June 28, to-day filed its schedule of liabilities and assets. The former totaled $556,424.83 and the latter $751,999.33.

The liabilities include $4,452.33 due to shop and office workers; $158,048.56 due to three creditors holding securities and consisting of the Dime Savings Bank, Detroit, $109,857.80, the People's National Bank, Jackson, Mich., $31,140.76 and the Gray estate, Detroit, $17,050.

Listed Liabilities

The unsecured claims total $391,925.37. Among the several hundred creditors coming under this section, the following are the biggest: Capitol Body Co., Indianapolis, Ind. $29,429.34; Griswold Motor & Body Co., Detroit, $20,714.52; Brown-Lipe-Chapin Co., Syracuse, N. Y., $14,838.52; Bearing Co. of America, New York, $4,367.74; A. B. C. Castings Co. Cleveland, Ohio, $4,929.92; B. F. Goodrich Rubber Co., Detroit, $15,996.74; Kelsey Wheel Co., Detroit, $23,316.23; Long Mfg. Co., Detroit, $6,853.44; New Departure Mfg. Co., Bristol, Conn., $11,487.64; Muncie Foundry & Machine Co., Muncie, Ind., $4,468.05; Penn Spring Works, Baldwinsville, Pa., $6,417.25; Ackerman & McNamara, Detroit, car painting and trimming, $30,010.42; Remy Electric Co., Anderson, Ind., $12,843.37; Massnick-Phipps Mfg. Co., Detroit, $28,585.31; Sheldon Axle Co., Wilkes-Barre, Pa., $9,252.67; J. C. Wilson Co., Detroit, $11,929.17; Willard Storage Battery Co., Cleveland, Ohio, $5,258.27; Royal Equipment Co., Detroit, $7,525.37; Victor Lamp Co., Cincinnati, Ohio, $4,418.27.

There also appears an item of $109,857.80 under the heading of Liabilities on notes or bills discounted which ought to be paid by the drawers, makers, acceptors or endorsers.

Assets Scheduled

Among the items mentioned in the assets schedule are the following: Real estate, $89,111.36; cash, $111.86; bills, notes, securities, etc., $114,991.10; stock in trade, $227,696.36; machinery, tools, etc., $86,062.65; debts due to petitioner, $84,826.60; patents, copyrights, etc., $150,000.

The first meeting of the creditors has been called for July 15.

The Detroit Trust Co., receiver, will not have its report on the assets and liabilities of the Briggs-Detroiter Co. ready for several days.

$1,328,000 More in Rubber

Nine Rubber Concerns Increase Capitals This Much—Goodrich Is Leader

AKRON, OHIO, July 3.—The nine big rubber factories of Summit county, Ohio, will swell the personal property valuation to the extent of $27,338,000 this year. Returns from the various rubber companies just received by the district tax assessors, show increases in personal property holdings of $1,528,000 over last year, and one decrease of $200,000, or a net increase of $1,328,000.

Real estate valuations for the rubber concerns will be the same as the 1914 original valuation, on which the rubber men agreed early last year, but which failed to go on the tax duplicate owing to the reversion to the 1913 duplicate. The realty for the Goodrich alone totals $5,000,000.

Effect of Rubber Embargo

All the rubber factories increased their personal business during the year except Goodyear, which showed a falling off of $200,000 in stock and raw material. The appraisal is based on monthly averages for the past year, and the decrease at the Goodyear is blamed on the rubber embargo placed by England, seriously interfering with the factory's accumulation of raw rubber.

The greatest increases over last year are shown by the reports of Goodrich, with $1,000,000 more than 1914; Kelly-Springfield, with a growth of $166,000, and Firestone, with $100,000.

Remarkable growth in the business of the two rubber concerns at Cuyahoga Falls is shown, the Marathon increasing its stock by $69,000 and the Falls Rubber having an increase of $66,000.

The personal returns of the various rubber companies and their increases over 1914 are given herewith:

Goodrich—$16,000,000, increase $1,000,000; total return with realty, $21,000,000, with $18,000,000 in Akron and $3,000,000 in Kenmore.

Goodyear — $4,944,000; decrease of $200,000.

Firestone — $4,130,000; increase, $100,000.

Kelly-Springfield—$848,000; increase $166,000.

Miller—$685,000; increase $40,000.

Swinehart—$310,000; increase $71,000.

Portage, Barberton — $177,000; increase $16,000.

Marathon—$184,000; increase $69,000.

Falls Rubber — $134,000; increase $66,000.

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Market Prices Steady

NEW YORK CITY, July 5—Market prices this week were steadier, there being few changes. Tin featured the metal markets with a $2.72 drop on a 100-pound basis. This was due to the heavy importations and the increase in tin afloat to this country.

Aside from this change there was no other of any importance. There was little activity in the other metal prices. The demand for copper during the past week was of small proportions. The demand for aluminum is limited, with prices being quoted at 30 cents a pound. Fine Up-River Para rubber remained strong at 63 cents. The oils and lubricants markets were unchanged and steady.

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Trucks Gain 4346 in New York State Over 1914

NEW YORK CITY, July 7—Between Feb. 1 and June 15, 18,981 commercial motor vehicles were registered in New York State, 4346 more than for the same period in the year 1914. Of the total of 18,981 motor trucks registered this year, 11,784, or 61 per cent, were registered at the branch automobile registration bureau in this city. This latter figure is 2246 machines in advance of the registration of motor trucks during the corresponding period in 1914, so far as this city and its neighborhood are concerned.

The statistics are contained in a report recently issued by the automobile bureau of the Secretary of State's office. Similar statistics for the same period in the year 1914 were 14,635 motor trucks registered for the entire State and 9538 for this city and vicinity, showing substantial progress is being made in the use of motor-driven commercial vehicles.

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Chandler Dividend of 77½ Per Cent on Common

CLEVELAND, OHIO, July 1—The directors of the Chandler Motor Co. have declared a cash dividend of 77½ per cent on the $225,000 common stock, in addition to the regular quarterly dividend of 1¾ per cent on the $200,000 preferred.

The 77½ per cent on the common makes a total of 100 per cent on that issue since dividends were commenced just one year ago.

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Prest-O-Lite Buying Up Bonds

NEW YORK CITY, July 2—The Prest-O-Lite Co. is calling for payment at 110 August 1 on the remainder of its ten-year 7 per cent debenture bonds outstanding.

There were originally issued of the debentures $2,000,000. Up to the close of last January the company had redeemed and canceled or held in the treasury for sinking fund purposes, $1,382,500 of the bonds, so that there were outstanding at that time $617,500. The indenture securing the bonds is dated June 23, 1913, and the company within two years is ready to retire the entire $2,000,000 issue which is not due until 1923.

The annual report for the year ended Jan. 31, 1915, showed net earnings of $1,338,696 after interest charges, and during the year it bought $1,039,000 of bonds for the sinking fund. In the last fiscal year the company's gross sales were $4,699,377, or $209,516 more than the preceding year, and its net earnings were equivalent to about $17 a share on the stock. For the 3 previous years net earnings averaged $1,000,000 yearly.

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Locomobile Gets War Order

NEW YORK CITY, July 1—The Locomobile Co. of America, Bridgeport, Conn., which is building a large addition to its plant, recently took an order for 500 trucks and several hundred officers' pleasure cars, for Russia and Great Britain. The company also has a large order for France.

At the plant there are three British, three French and the same number of Russian officers inspecting every car that is turned out for their countries.

The company is working on an order

Daily Market Reports for the Past Week

Material.	Tues.	Wed.	Thurs.	Fri.	Sat.	Mon.	Week's Changes
Aluminum	.30	.30	.30		.30	.30	.....
Antimony	.36	.36	.36		.36	.36	.....
Beams and Channels, 100 lbs.	1.31	1.31	1.31		1.31	1.31	.....
Bessemer steel, ton	19.00	19.00	19.00		19.00	19.00	.....
Copper, elec., lb.	.20	.20	.20		.20	.20	.....
Copper, lake, lb.	.21	.21	.21		.21	.21	.....
Cottonseed oil, bbl.	6.10	6.20	6.17		6.10	6.12	+0.02
Cyanide potash, lb.	.24	.24	.24		.24	.24	.....
Fish oil, menhaden, brown	.40	.40	.40		.40	.40	.....
Gasoline, auto, bbl.	.12	.12	.12		.12	.12	.....
Lard oil, prime	.90	.90	.90		.90	.90	.....
Lead, 100 lbs.	5.75	5.75	5.75		5.75	5.75	.....
Linseed oil	.62	.62	.62		.62	.62	.....
Open-Hearth steel, ton	19.50	19.50	19.50		19.50	19.50	.....
Petroleum, bbl., Kans., crude	.40	.40	.40		.40	.40	.....
Petroleum, bbl., Pa., crude	1.35	1.35	1.35		1.35	1.35	.....
Rapeseed oil, refined	.85	.85	.85		.85	.85	.....
Rubber, fine up-river, Para	.63	.63	.63		.63	.63	.....
Silk, raw, Ital.	3.75	.....	3.75		.....	.....	—0.10
Silk, raw, Japan	3.37½	.....	3.20		.....	.....	—0.17½
Sulphuric acid, 60 Baume	.90	.90	.90		.90	.90	.....
Tin, 100 lb.	41.50	40.50	40.50		41.00	38.78	—2.72
Tire scrap	.04¾	.04¾	.04¾		.04¾	.04¾	.....

for forty trucks which will be fitted up as soup-kitchens for Russia. These are simply chassis with the drivers' seats, and will be fitted in Russia. The company is taking on additional help all the time.

A car de luxe for Grand Duke Nicholas of the Russian army was recently finished by the company.

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Republic Tire Receives $500,000 Foreign Order

YOUNGSTOWN, OHIO, July 1—The Republic Rubber Co., this city, has been advised by cable of an order for $500,000 worth of solid rubber tires from abroad. The name of the purchaser is withheld, but it is supposed to be the British Government. This company is now completing a contract for $250,000 worth of similar tires, and will ship the last of this lot this week. The order calls for the delivery of 10,000 tires per month. They are built on special steel rims and are intended for use on trucks at the front.

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Bright Outlook for Electrics in Norway

CHRISTIANIA, NORWAY, June 14—That the sale of electric automobiles in Norway has a bright outlook is claimed in consular reports recently made out in Christiania. Although the country is composed of many hills, it is claimed that that type of car could be used to advantage there.

Electric power plants are not far apart in Norway, thus rendering it possible for a car to travel practically all over the country and be recharged whenever needful.

Security Changes Small

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Tire Issues Lower—Changes Range from One to Five Points

NEW YORK CITY, July 5—The securities markets were in a sensitive condition throughout last week as a result of the passing of the U. S. Rubber dividend on Thursday. The markets were weak and dull. Gains were few and small, ranging up to 4 points. Losses were also small, ranging up to 5½ points.

Tire issues last week were somewhat lower, Goodrich, Goodyear and Miller Rubber issues being the only ones to show increases. Firestone after reaching a record quotation of 503 a week ago, dropped to 500 last week. Studebaker preferred managed to show a 1½ point gain. General Motors common was the only other automobile stock to show a gain, that being 4 points.

The Detroit issues were normal, the gains ranging from a fraction to 2¼ points. In the inactive stock, the Canadian Ford stock gained 275 points.

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War Orders Increase International Motor Earnings

NEW YORK CITY, July 1—The net earnings of the International Motor Co. in the month of May are understood to have amounted to over $90,000 after deducting all interest charges. Earnings for the 5 months ending May were over $160,000, and on the present basis of business, earnings for the full year may aggregate $700,000.

This is equivalent to 19 per cent on the $3,600,000 7 per cent cumulative preferred stock, on which no dividends have been paid since September, 1912. The company has outstanding $5,628,125 common stock.

The war has been the cause of part of the improvement in business of the company, as its factories are working to capacity to turn out Saurer trucks for shipment to England, France, and indirectly to Belgium.

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Syndicate Sells Its Stewart-Warner Stock

NEW YORK CITY, July 3—The syndicate headed by White, Weld & Co. and Hornblower & Weeks, which purchased 40,000 shares of Stewart-Warner Speedometer common stock from J. K. Stewart, president of the company, has sold all the stock, the offering price being 67.

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U. S. L. Property Brings $1,000,000

BUFFALO, N. Y., July 1—At the receivers' sale of the U. S. Light & Heating Co. held at Niagara Falls, the stockholders' protective committee bought the property for $1,000,000.

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Federal Truck Pays $50,000 Dividend

DETROIT, MICH., July 2—The Federal Motor Truck Co. has declared a 10 per cent dividend, aggregating $50,000.

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Goodyear Record 15,447 Tires

AKRON, OHIO, July 3—The Goodyear Tire & Rubber Co. has broken its daily production record of 11,032 tires, having recently produced 15,447.

Automobile Securities on New York and Detroit Exchanges

	Bid 1914	Asked 1914	Bid 1915	Asked 1915	Wk's Ch'ge
Ajax-Grieb Rubber Co. com	200	..	300	..	..
Ajax-Grieb Rubber Co. pfd	98	..	101	110	..
Aluminum Castings pfd	98	100	98	100	..
J. I. Case pfd	81	86	70	79	..
Chalmers Motor Co. com	101	104	91	92¾	—1
Chalmers Motor Co. pfd	94	97	95	98	..
Electric Storage Battery Co.	51	52	53	53½	+1
Firestone Tire & Rubber Co. com	299	304	500	506	—3
Firestone Tire & Rubber Co. pfd	108½	110	109	111	—2
General Motors Co. com	93	94	156	157	+4
General Motors Co. pfd	92	93	101	102	..
B. F. Goodrich Co. com	23	24	53	54½	+1½
B. F. Goodrich Co. pfd	87½	88	103	105	+2
Goodyear Tire & Rubber Co. com	166	172	269	272	+4
Goodyear Tire & Rubber Co. pfd	96	98	106	107	+1
Gray & Davis, Inc., pfd	98	102	..	..	..
International Motor Co. com	..	3	13	14	—1
International Motor Co. pfd	3	9	32	36	—5
Kelly-Springfield Tire Co. com	56	58	159	162	..
Kelly-Springfield Tire Co. 1st pfd	76	80	85½	86½	— ½
Kelly-Springfield Tire Co. 2d pfd	94	100	160	165	..
Maxwell Motor Co. com	14	15	35	35½	—4
Maxwell Motor Co. 1st pfd	41	42½	82	83	—2
Maxwell Motor Co. 2d pfd	17	18	31½	33	—2½
Miller Rubber Co. com	..	..	190	192	+3
Miller Rubber Co. pfd	..	..	103	105	—1
New Departure Mfg. Co. com	125	127	..	..	..
New Departure Mfg. Co. pfd	105	108	..	..	..
Packard Motor Car Co. com	103	..	109	..	..
Packard Motor Car Co. pfd	97	100	96½	101	—3½
Peerless Motor Car Co. com	..	17	67	70	..
Peerless Motor Car Co. pfd	..	50	94	96	..
Portage Rubber Co. com	..	30	35	38	—4
Portage Rubber Co. pfd	..	90	92	95	—1
Reo Motor Truck Co.	11½	12½	15	16	— ¾
Reo Motor Car Co.	17¾	18½	29¼	30	—1¾
Splitdorf Electric Co. pfd	40	50	..	..	..
Stewart-Warner Speed. Corp. com	51	52	67½	68¼	— ½
Stewart-Warner Speed. Corp. pfd	98	99	104	107	—1
Studebaker Corporation com	29	30	76	78	—2
Studebaker Corporation pfd	80	84½	100	100½	+1½
Swinehart Tire & Rubber Co.	85	87	77	78	..
Texas Company	142	143	127	128	+3
U. S. Rubber Co. com	59	59½	45½	47	—5½
U. S. Rubber Co. 1st pfd	102⅜	103	105	106	—1
Vacuum Oil Co	218	221	195	198	—2
White Company pfd	107	110	103	108	..
Willys-Overland Co. com	88	92	126	128	—2
Willys-Overland Co. pfd	93	95	102	103½	— ½

*Par value $10; all others $100 par value.

OFFICIAL QUOTATIONS OF THE DETROIT STOCK EXCHANGE

	Bid 1914	Asked 1914	Bid 1915	Asked 1915	Wk's Ch'ge
ACTIVE STOCKS					
Chalmers Motor Co. com	101	103	..	95	..
Chalmers Motor Co. pfd	..	96	96	99	+2¼
Continental Motor Co. com	..	180	185	..	+5
Continental Motor Co. pfd	..	75	82	86	..
General Motors Co. com	90	92	153	156	+2¼
General Motors Co. pfd	91	94	101½	103½	..
Maxwell Motor Co. com	13¾	14½	38	41	—1
Maxwell Motor Co. 1st pfd	40½	42½	83½	86	—1
Maxwell Motor Co. 2d pfd	16½	18	34	37	—1
Packard Motor Car Co. com	103	112	..	112½	..
Packard Motor Car Co. pfd	97	100	96¼	100	—1
*Reo Motor Car Co.	18	18¾	30	31	+ ½
*Reo Motor Truck Co.	11⅜	12¼	15⅜	16⅛	+ ⅜
Studebaker Corporation com	..	..	76	78	—2
Studebaker Corporation pfd	..	..	98½	100½	..
INACTIVE STOCKS					
*Atlas Drop Forge Co.	19	..	..	26	..
Ford Motor Co. of Canada	..	555	1275	..	+275
Kelsey Wheel Co.	185	..	205	..	+5
*W. K. Pruden Co.	..	20½	19½	21	..
Regal Motor Car Co. pfd	20	..	..	25	..
BONDS					
General Motors, notes, 6s, 1915	101	102	..	..	..
Packard Motor Co. 5s, 1916	95	98½	98¼	..	..

*Par value $10; all others $100 par value.

Georgia $5 Tax Enjoined

State and Cities Will Regulate Cars—Case Will Be Appealed

SAVANNAH, GA., July—Granting an injunction restraining the State from collecting $5 registration fee from owners of automobiles and motorcycles in Chatham County, Judge Charlton in the Supreme Court held that the city and State had a right to regulate them, but that the provision that the proceeds be distributed among counties for roads in accordance with the number of miles of rural route is invalid.

It is considered certain that the case will be appealed by the State and city. If the findings of the lower court are sustained they will next be heard by a jury, when it will be determined whether permanent injunctions shall be issued.

Judge Charlton held that in effect the law virtually double taxes owners of automobiles.

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Licensing of Chauffeurs in Ohio Unconstitutional

COLUMBUS, OHIO, July 3—Judge Dillon in Common Pleas Court, has declared the Ohio law providing for the licensing of chauffeurs by the Secretary of State unconstitutional in the case of Joseph Dayton, charged with operating a car without a license. The case came up originally in the police court, where the law was held unconstitutional by Judge Osborn.

The court held that since the law does not fix a standard of qualification for chauffeurs it is not valid as it depends on the arbitrary wish or caprice of the Secretary of State. The case will likely be appealed to the Ohio Supreme Court for final adjudication.

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Wisconsin Law Protects Dealers

MILWAUKEE, WIS., July 2—Wisconsin automobile dealers who sell cars on credit—and most of them do—have obtained the protection so long desired by the passage of a law by the Wisconsin Legislature, and now in effect, which makes the use of false statements to obtain property on credit a penal offense.

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Ill. Wheel Tax a Law

SPRINGFIELD, ILL., July 3—Illinois cities now have the privilege of affixing a wheel tax to all automobiles and other vehicles if they see fit. The supreme court set aside the previous law, declaring it unconstitutional on a case appealed from Lincoln. Owing to the importance of this tax to Chicago and the larger cities, the legislature changed the law to meet the objections of the courts. The revised bill became a law when Governor Dunne signed it this week. The tax in Chicago on automobiles is $10 to $20, in accordance with the horsepower.

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Wisconsin Licenses 77,160 Cars in 1914

MADISON, WIS., July 2—During the fiscal year of the State of Wisconsin ending June 30, 1915, a total of 77,160 licenses were issued for automobiles owned by private owners, compared with 49,625 issued during the preceding fiscal year. It is interesting to note, however, that the total 1915 registration on June 28 was 69,116, compared with 53,161 issued during the whole of 1914. On this basis the 1915 registration will exceed 75,000, the figure set at the beginning of the year, and probably run well above that. In 1914 more than 8000 cars were registered between July 1 and Dec. 31, and figuring along these lines, the 1915 total will be approximately 78,000.

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137,383 Cars in California

SAN FRANCISCO, CAL., July 3—There are 137,383 automobiles in California. Los Angeles leads the fifty-eight counties with 46,447. San Francisco is second with 14,714 and Alameda, third, with 9417.

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Nearly 30,000 Automobiles in Conn.

HARTFORD, CONN., July 2—There are nearly 30,000 registered automobiles in the State of Connecticut according to the new motor vehicle register which has just been issued by a private concern in Hartford. The new publication covers registrations up to June 19. Within the past 3 months 3000 cars have been registered as jitneys. This type of conveyance is said by railroad officials to be the cause of curtailment of train service throughout the State. The business of the Secretary of State's office in car registrations will be at least one-half million dollars this season.

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Kentucky Fees $98,586

LOUISVILLE, KY., July 3—Kentucky automobile licenses collected since Jan. 1 amount to $98,586.29. January, $9,883.39; February, $12,826.60; March, $16,107.37; April, $14,556.27; May, $9,305.65, and June, $36,406.99. The law making all licenses to expire Jan. 1 went into effect last June, and so this year all licenses as they are renewed are prorated for the time until Jan. 1, 1916. Consequently the amounts of renewals are not as large by several thousands of dollars as they would be had they been for the full period of twelve months.

77,339 Cars in Canada

Commercial Cars Number 68,320—Pleasure Cars 1,155 and Dealers 1,120

TORONTO, ONT., July 3—The following figures herewith indicate the number of automobiles in Canada to date which runs over 70,000.

Province	Commercial Cars	Pleasure Cars	Dealers	Motor Cycles
Ontario	31,724	Inc.	260	3,633
Quebec	6,824	384	137	205
Nova Scotia	1,194	7	20	96
New Brunswick	1,940	25	20	70
Prince Edward I.	44	...	2	3
Manitoba	6,600	275	360	940
Saskatchewan	8,963	Inc.	124	461
Alberta	4,630	98	86	387
British Columbia	6,370	363	109	944
Yukon	31	3	2	7
Total	68,320	1,155	1,120	6,746

—

Missouri Registrations Increase 20 Per Cent Over 1914

JEFFERSON CITY, MO., July 1—An increase of about 20 per cent in the number of automobiles registered in the State of Missouri during the first five months of the current year over the same months last year is indicated in a statement issued by the Secretary of State here to-day.

The report shows that 66,061 automobiles were registered between February 6, the beginning of the registration year, and June 30. This is an increase of 11,563 over the figures for a similar period in 1914. In view of these figures, State officials predict that a total of more than 75,000 cars will be registered during the present year.

St. Louis and Kansas City respectively lead in the number of high-priced cars registered.

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Indiana Has 81,608 Cars

INDIANAPOLIS, IND., July 3—There are 81,608 automobiles registered in Indiana, a gain of 26,608, compared with the number of registrations issued the first six months of last year, and 15,108 higher than the entire year of 1914. The receipts of the State department for the six months was $535,049. There are 650 retail automobile dealers in the State.

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$600,000 Invested in Oregon Cars

PORTLAND, ORE., July 3—During the month ending June 15 the Oregon registrations show that, at an average of $750 per car the people of that State have invested $600,000 in machines. Nearly $20,000 a day, which is much larger than the amount expended during former years. There were 1,377 new registrations for the month. The Ford outstripped all other makes with 464.

Indianapolis Speed Amazes French

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Thought Record Would Stand for Another Year—So Kept Out of Race

PARIS, June 18—Owing to the war, result of Indianapolis 500-mile race reached Paris after a delay of one week. Rene Thomas, last year's winner, is delighted at the speed attained, his only regret being that he was unable to be present.

"I am glad to hear Ralph De Palma has broken my record, and I want to congratulate him on what must have been a wonderful race. Manufacturers over here seemed to think the record would stand for another year, and on that account were not disposed to send cars. This is a lesson to them that in the racing game, progress must be constant. France had the cars and she had a few good drivers free from military service; she ought to have sent those men across, instead of being satisfied to live in the false hope that the old record would remain untouched."

As a race driver Rene Thomas was interested in the weather conditions and the make of tires used by the winner. Translated into American, Thomas's expression was, "De Palma certainly had no bum tires on his car to average nearly 90 miles an hour for such a distance."

Louis Delage, while expressing admiration at the result, appeared to be surprised and disappointed that the record of 1914 had been cut by such a big margin. The Delage chief engineer, M. Michelat, stated that if the new Delage cars had gone out they would have been sent with the intention of taking a big slice out of Thomas's old record, but he did not know enough of the track conditions at Indianapolis to predict the highest speed they could hope to make.

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Chevrolet Cars on Indiana Tracks

INDIANAPOLIS, IND., July 3—The William Small Co., distributor for the Chevrolet car in the State of Indiana, has received two specially constructed race cars from the Chevrolet factory that will be used in State fair dirt track races throughout the State this summer. William Brown of Fort Wayne, Ind., will pilot one of the cars and the other will be driven by William Doughty of Bluffton, Ind.

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Spokane Speedway Assn. Formed

SPOKANE, WASH., July 2—The Spokane Speedway Assn. has been organized and incorporated by a group of Spokane sportsmen. The officers of the association are A. E. Terrelle, E. F. Guerske, W. E. Camp, H. A. Holland and E. W. Stutes.

It is planned to build a two-mile speedway close enough to the center of Spokane so that it may be reached by street railways. The association has been incorporated for $100,000, with which amount it is intended to purchase the ground and construct the track. Negotiations are now pending for the property.

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Indianapolis Show Sept. 6

INDIANAPOLIS, IND., July 5—The Indianapolis Automobile Trade Assn. will be the first organization to stage an exposition of 1916 automobiles. At a meeting held at the Hoosier Motor Club it was practically decided to hold another show at the Indiana State Fair the week of September 6.

The show will be held in a large tent covering approximately 30,000 square feet, for which a charge of 10 cents per square foot will be made members of the trade association and 20 cents will be charged those not members.

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Wichita Show Oct. 4-14

WICHITA, KAN., July 2—The local automobile dealers will hold an automobile show in connection with the International wheat show, Oct. 4 to 14. Practically every inch of the 8800 sq. ft. of floor space was sold at a dinner given to the automobile men by the exposition committee. The exhibit will be held in a special building.

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More Time Given Exposition Motorists

SAN DIEGO, CAL., July 1—The Panama-California Exposition officials are becoming more lenient to motorists. Automobiles are now allowed inside the fair grounds after 6 p. m.

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Boston Races July 10

BOSTON, MASS., July 5—The automobile races scheduled to be held at the Readville track here to-day under the auspices of the Matty Matthews Racing Assn. had to be postponed because of heavy rains during the forenoon. They will be run off next Saturday afternoon.

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Automobiles for St. Louis Mail Service

ST. LOUIS, MO., July 1—Automobiles replaced collection wagons in the complete reorganization of the mail service here to-day. On instructions from Washington the local postmaster put into the discard all but four of the wagon outfits and substituted therefor twenty-four light and fast automobiles. The few horse-drawn vehicles will be put in outlying districts when roads are bad.

Yellowstone Plans Completed

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Regulations Governing Use of Cars in Park Not Yet Public

WASHINGTON, D. C., July 2—The plans for opening the Yellowstone National Park to automobiles Aug. 1 is now complete, but the regulations governing the use of machines in the park will not be made public for some time until they have been criticised by some of the officials in charge of the park. An elaborate set of rules governing the operation of cars has been compiled and while these regulations are strenuous they are considered necessary at the start. It may be several seasons before the mountain horses used in the park will be accustomed to motor traffic, and so modifications will be necessary from year to year in these regulations. The object of the stringent regulations is to guard against accidents due to the use of motor vehicles which would mar the opening of the park to automobiles.

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Twin City Eliminations August 28-31

MINNEAPOLIS, MINN., July 3—Entry blanks are being issued by the Twin City Motor Speedway Co. for its 500-mile race in Sept. 4. The race will be under A. A. A. sanction the eliminations Aug. 28-31, with 80 m.p.h. speed for one lap of the two-mile track as the minimum. First prize is $20,000 and the remainder of the $50,000 is divided into eleven prizes from $10,000 down to $650. The three-mile fence around the grounds is erected, footings are placed for the seven grand stands and the bleachers. The grading will be completed July 15. Concrete laying began July 6 and will be completed in thirty days. Six inches of cement will be placed over 18 in. of concrete. Three hundred and fifty men are employed in the work, which is progressing rapidly.

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Damaged Road—Fined $25

BALTIMORE, MD., July 3—The first case in Maryland of a man being charged with operating a motor vehicle without due regard for wear upon the highway was tried in Baltimore yesterday. Clarence Thornburg, a chauffeur for the Pierce-Arrow Co., was fined $25 and costs. He ran a motor truck over the asphalt of one of the main thoroughfares. Two of the wheels were without tires and the flanges cut into the paving, causing damage amounting to about $100.

Indiana S. A. E. To Study 12's

Section Will Meet September 17 —Paper by J. G. Vincent —Growth Planned

INDIANAPOLIS, IND., July 3—Thorough discussion of the twelve cylinder motor, with a paper on the subject by J. G. Vincent, vice-president and chief engineer of the Packard Motor Car Co., will feature the opening meeting of the Indiana section of the Society of Automobile Engineers, which will be held here Friday evening, Sept. 17.

Mr. Vincent is the designer of the twin-six, the first twelve-cylinder car marketed in this country, and it is of special interest to have him present a paper on that subject.

W. G. Wall, of the National Motor Vehicle Co., chairman of the committee on papers, who is also the designer of a twelve-cylinder motor, announces that he expects a large number of engineers from the various Indiana plants to be present and take active part in the discussion. Since two Indianapolis firms have already announced twelve-cylinder models, it is expected that the September meeting will be one of the most interesting that the Indiana section has ever held.

There are no meetings of the section during the summer months and the gathering in September will be the start of the regular fall and winter meetings.

The Indiana section of the society expects to expand greatly during the next few months and only recently adopted a new constitution which provided for the election of associates to the Section. This associate membership entitles the holder to all privileges of the Section, but does not make him a regular member of the national Society of Automobile Engineers.

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Detachable Disk Wheel

PARIS, FRANCE, June 29—Michelin, the French tire manufacturer, has placed on the market a detachable disk wheel for touring car use. Owing to the war, delivery is not being made on a big scale, but a certain number of sets has been supplied for military cars and the Michelin company's touring cars and light delivery vehicles have been using these wheels for several months.

Advantages claimed for the wheel are ease of attachment and detachment, lower weight than the artillery type wheel, additional strength compared with a wood wheel, and a decided gain in the ease of cleaning compared with either wood or wire wheels. Details regarding the structure of the wheel have not been given out. It is a pressed steel type, deeply dished, and welded to the rim. It is attached by six bolts secured to the fixed hub and passing through the wheel felloe. Six nuts hold each wheel in position. Threads are cut left and right on the opposite sides of the car, so that the tendency is for the nuts to tighten up as the wheel revolves, and avoiding the use of lock washers. The Michelin bolt valve is used with the wheel, no safety lugs being employed. The valve projects on one side of the disk, thus avoiding cutting a hole in this latter. Easy washing is a feature.

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Tires Shipped by Parcel Post

WASHINGTON, D. C., July 2—Postmaster Otto Praeger has put in a plan whereby Washington motorists when on tour can ship their tires back to Washington for repairs by parcel post. The plan was launched a week ago as an experiment and proved such a success that it has been made a permanent feature of the parcel post plan. Tires weighing 11 pounds are carried for 10 cents in the local zone, in an 8-mile radius and 15 cents for the first and second zones; the 14-pound tire takes a 12 and 18-cent rate; 17-pound, 13 and 21 cents; 21-pound, 15 and 25 cents; 22-pound, 16 and 26 cents; 30-pound, 20 and 34 cents, and 35-pound, 23 and 39 cents.

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American Cars in Demand in British Market

LONDON, ENGLAND, June 24—The war has opened the field for American automobiles in England, where they were never able to break into the market in peace times. Now that the English government has taken over all English automobile factories, a great demand has been created for the high-priced American touring car.

An agent in this city has sold 1500 of the high-priced cars within the last 30 days and could have sold 3500 more if he could have filled the orders. He attributed it to the fact that many persons who never before have been able to afford cars are now making large sums of money from the government contracts and are spending their new wealth on automobiles and other luxuries.

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Snyder Promoted

DETROIT, MICH., July 3—C. Snyder, who was with Chalmers for 14 years, and who was efficiency man for the National Cash Register Co., Dayton, Ohio, has been promoted to the position of superintendent of manufacturing.

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Lazelle Marion State Sales Mgr.

JACKSON, MICH., July 3—U. E. Lazelle has been appointed State sales manager by the Marion Motor Co.

Gasoline Prices in S.W. Unsettled

Gallon Costs from 11 to 20 Cents in Western Texas— Claim Overcharge

AUSTIN, TEXAS, July 3—Inquiry among automobile tourists who have traveled through Oklahoma, Texas and New Mexico during the last few weeks reveals a remarkable lack of uniformity in gasoline prices, which cannot be accounted for by the difference in freight charges on the product, as applied to the various points. It is found that in some of the towns of western Texas as much as five cents difference in the price per gallon exists between local dealers. It is claimed by overland travelers that it is not infrequently the case that dealers take advantage of the tourist by charging an exorbitant price for gasoline and that this condition is also true of some of the garage and repair men. The price of gasoline in Texas ranges all the way from 11 cents to 20 cents per gallon. In western Texas 13 cents to 15 cents are the prevailing prices, although it is not unusual for as much as 20 cents to be charged. In New Mexico the situation is about the same as in western Texas. As an evidence of the unstability of the local markets it may be noted that one town may announce a raise of the price a cent or two per gallon to-day and perhaps another town not far away may declare a reduction. In Oklahoma the prices also show a fluctuation and a lack of uniformity which is not based on the wholesale prices or the freight rates.

The cost of gasoline is an important item to the long distance tourists and many of them object to being made the victims of exorbitant charges. What is true as to gasoline prices is also the case as to lubricating oil. A difference of as much as 25 cents per gallon in the same brand of oil in the original package is found in towns which have the same freight rate.

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1916 Abbott 8-80 on the Market

DETROIT, MICH., July 3—The 1916 Abbott-Detroit, 8-80, an eight-cylinder, seven-passenger design manufactured by the Consolidated Car Co. of this city, has been announced and shipments are now being made. The motor is the Herschell-Spillman unit power plant, its dimensions being 3¼ by 5 with the cylinders in blocks and using the single camshaft scheme with sixteen integral cams. The cylinder blocks on this motor are staggered and instead of the forked connecting-rod, a side-by-side arrangement is employed. The crankshaft is carried on three main bearings. While

the S. A. E. rating is 33.8 hp., it is claimed by the makers that 80 can be developed on the block and a speed of 70 m.p.h. on high can be reached.

Other specifications include a Stewart vacuum feed, Duplex carbureter, Auto-Lite electric system with Remy battery ignition, disk clutch, worm and wheel steering, left drive and center control. The springs are underslung, semi-elliptic front and three-quarter elliptic rear with the perches swiveled at the axle. The final drive is through spiral type bevel gears and floating rear axle mounted on Timken axles at the differential and annular bearings at the wheels. Special attention has been given to the body which is of somewhat foreign appearance, a suggestion that is enhanced by the sloping windshield. A new one-man top is included in the equipment as is a full set of instruments on the walnut dash, German silver clock and 35 by 4½ tires, non-skid in rear. The wheelbase is 121 in. and the standard color Brewster green. The price is given as $1,950.

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To Sell Wilcox-McKim

SAGINAW, MICH., July 3—Efforts to re-finance and re-organize the Wilcox-McKim Co., which made automobile steering gears, piston rings and other parts and light machinery, having failed, the plant and its equipment will be sold, by order of the United States district court. Full particulars may be obtained from E. D. Church, trustee in bankruptcy in Saginaw.

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New Sparton Hand Horn

JACKSON, MICH., July 3—The Sparks-Withington Co. is delivering a new hand-operated horn, Model G, which is a third larger than any other hand-operated horn. The diaphragm-vibrating mechanism is similar to that used in other hand-operated Spartons and the operating lever is pushed forward to sound the horn. The diaphragm is hand-hammered. A rigid bracket is supplied which can be screwed to any part of the car, only a screwdriver being required to put the horn in place. It lists at $7.

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Hassler Shock Absorber Expands

INDIANAPOLIS, IND., July 3—Robert H. Hassler, Inc., the manufacturer of the Hassler shock absorber for Ford cars has fitted up a plant with complete machinery, in the Prest-O-Lite Building, 227 East South Street, this city, with a capacity of 500 per day.

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Oakland Changes in Detroit

DETROIT, MICH., July 3—Beginning this month, the Standard Auto Co. becomes the Oakland distributor in Detroit, also Wayne, Monroe, and part of Macomb counties.

A Field for Cars Under $500

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War Cripples Will Want Many —Hand Control a Desirable Feature

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By H. D. Van Sant
American Consul

DUNFERMLINE, SCOTLAND, June 17—In view of the constant arrival of disabled officers and soldiers from the front, including the many with frost bitten feet and the thousands of invalids and crippled civilians in the United Kingdom, the need for a small motor or motor tricar—a good hill-climber for Scotland—at a comparatively low cost, is more apparent in this district and Scotland than ever. Something that will be safe to handle and inexpensive to run and at a cost not to exceed $500 would meet with ready sale in the near future, especially as no such machine has thus far been perfected, at least as far as the writer has been able to observe in this district. An objection to the tricar type is the added danger of skidding and overturning at sudden corners or down steep streets or hills, so frequently met with in this territory.

Hand Control a Factor

If a machine propelled without the need of foot action or guided and controlled entirely by hand could be constructed at a price within the range of the middle class or the coming pensioner, it would find an unprecedented sale in the British market in the near future.

Already several inquiries have been made at this Consulate as to whether such a motor car is being made in America and also if catalog or other information regarding one is obtainable. Recently one or two British makers have been approached on the subject and have plans under consideration for the introduction of such a machine.

If an American-made machine of the desired pattern is introduced the demand for it is likely to prove beyond the ordinary. As the war progresses, the probability of a market for such cars has been estimated at from 10,000 to 20,000 the first year.

Cars and Trucks Show Wear

Already the many motor cars and trucks in this district requisitioned by the military is beginning to show signs of wear, and the sight of machines being repaired along the roads and at the garage is more frequently noticed, a number apparently being much worse for constant use, resulting in a number of inquiries at this office for new American cars. The low priced American machines appear to be holding their own with some of the higher-priced British made cars, notwithstanding their constant use day and night since the outbreak of the war, though it is apparent that the lighter woodwork and painting and varnish of the American car suffers in comparison with the higher priced British and French makes. But in the machine itself, the average American car is holding its own, and a further market for these cheaper cars will likely increase before another year, if the stock is renewed among dealers and agents throughout this district and Scotland.

Competition Keen

The competition between the sale of British, French and American cars has been so keen that agents here have declined to accept the agency for American cars other than those already represented, until at least after the beginning of the new year, and several American makers endeavoring to enter the field with the regular dealers have been told they would have to wait another year before their claims for representation would be considered. While the demand for cars is not likely to diminish the competition is keen and spirited, with a natural loyalty and inclination for the home product when all else is equal.

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Scarcity of Motor Transport Drivers in England

PORTSMOUTH, ENGLAND, June 24—The Hampshire Automobile Club has received a letter from a motor transport examining officer of the Army Service corps, drawing attention to the urgent need for an immediate increase in the number of drivers enlisting.

The supply of heavy car drivers is quite, and of commercial vehicles nearly exhausted, and the services of every private car driver are being asked for. The pay is $1.50 a day.

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Thomas Making $4,000 Six

BUFFALO, N. Y., July 5—Under the model name of series MF, the E. R. Thomas Motor Car Co. is putting out a six-cylinder car selling for $4,000. The motor has its cylinders cast in pairs and with a bore of 4¼ and a stroke of 5½ in. is rated at 43.3 hp. by the S. A. E. rating. Other specifications include a three-speed gearset, floating rear axle with spiral type bevel gears, 37 by 5 tires, 12-volt starting, five wire wheels and full accessory equipment.

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Walton Master Carbureter Sales Mgr.

DETROIT, MICH., July 1—A. B. Walton, who has been with the Master Carbureter Corp. since last October, has been appointed sales manager.

Make Gasoline from Natural Gas

Bureau of Mines Bulletin Treats of Preventing Waste of Gas in Oil Mining

NEW YORK CITY, July 2—Condensation of gasoline from natural gas is the title of a bulletin recently issued by the Bureau of Mines treating of a method of preventing the waste of natural gas incidental to oil mining. The bulletin points out that condensation methods may be made use of which offer the oil operator and others a profitable means of using some of the oil well gas now being wasted. The most desired constituent of crude oil is obtained, the production of oil is not hindered, and the gas, after the extraction of gasoline, can be returned to the leased area to drive pumps or to be put into pipe lines for uses to which natural gas is generally put. It is stated that the fuel value of the gas so returned is very little affected by the extraction of the gasoline product by means of the condensation process.

The authors of the bulletin, which is No. 88, are George A. Burrell, Frank M. Seibert and G. G. Oberfell. In this document they state that gas may be found in a sand separate from the oil; it may be found in more than one sand separate from the oil or the gas sand may be just above and in contact with the oil sand. A given sand may produce oil and gas in one place and in another part of the territory produce gas only.

Gas from Oil Sand

Gas may come from the same sand as the oil itself. It is this manner of occurrence of gas and oil that the authors desire to emphasize, for under these conditions the gas is frequently mixed with enough of the gasoline constituents of the oil to warrant the erection of a plant for the purpose of condensing the gasoline. The gas usually finds its way to the atmosphere through the space between the casing of the well and the tubing inserted for the removal of the oil. This gas is the so-called casing for the removal of the oil. This gas is the so-called "casing-head gas." At the beginning of an oil flow when the flow is natural, a large quantity of gas escapes to the air through the same tubing as the oil. Where the gas finds its exit to the atmosphere apart from the oil at the casing head it is a simple matter to make pipe connections between the casing head and any desired point where the gas is to be utilized. This is frequently done when the supply of casing-head gas is sufficient to warrant its utilization, but frequently, when the supply exceeds the small demands of the lease, the excess is wasted.

When a well is first drilled, the quantity of gas escaping with the oil from the tubing is frequently enormous, being 10,000,000 to 15,000,000 feet or more at times. As this gas is wasted, the flow in time diminishes.

When gas comes with the oil in the flow pipe, the two are often separated by means of a gas trap. The oil, entering the top of a drum, settles to the bottom and is withdrawn, and the gas flows off at the top. Many of the plants in California utilize gas that flows with the oil for condensing gasoline. One gasoline plant in the Cushing field, Oklahoma, also uses trap gas. A new type of trap for saving gas from gushers and separating the gasoline is described in this report.

Oil wells that have passed the flowing stage and are being pumped may still continue to give off much gas at the casing head. The quantity may vary from little or nothing at some wells to 500,000 cubic feet or more at others. When enough of the gas is available, it is used for pumping on the lease, the excess being wasted. A steam pumping engine of 50 horsepower requires about 25,000 cubic feet of gas for 10 hours' operation. From 12 to 15 cubic feet of natural gas is needed per horsepower-hour for gas engines that are used on leases for pumping oil wells. If there is not enough of the gas available for working pumps, it is all allowed to go to waste, or perhaps some is used for heating and lighting a few scattered houses on the lease.

The efficient utilization of the wasting casing-head gas ordinarily is a difficult problem. The many miles of pipe that would have to be laid to transport it from a field would usually be an unwarranted expense. However, some towns, among which may be mentioned Warren, Pa., and Sistersville, W. Va., are lighted and heated largely with casing-head gas.

In general, however, the oil man considers casing-head gas as waste gas and its escape necessary in oil-well operations, to permit the maximum flow of oil into the well from the surrounding strata.

The bulletin also treats of the effect of drilling neighboring wells; the effect of formation of waxy sediment; the history of the making of gasoline from natural gas; the chemistry of natural gas, and many other matters of interest along these lines.

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Wis. Sleigh-Tread Law Repealed

MILWAUKEE, WIS., July 3—The Wisconsin Legislature has repealed the 1913 statute known as the "wide sleigh" law, providing that no sleigh could be manufactured or sold in Wisconsin after Jan. 1, 1914, unless the gage of the tread was 56 in., the gage of practically all wheeled vehicles in Wisconsin. The repeal was not opposed by motoring organizations, the belief being that no law is necessary for the use of wide sleighs. The argument in favor of the repeal was that it caused much confusion in the sleigh manufacturing trade, which has been obliged to make a special tread for Wisconsin buyers. The general opinion is that inasmuch as the advantages of the wide tread have been convincingly pointed out by two winters' use among farmers, they will not go back to the narrow tread. The repeal of the law makes the tread optional.

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Thirty-two Louisville Jitneys Under One $5,000 Bond

LOUISVILLE, KY., July 5—Following a period of several weeks of idleness, thirty-two jitney buses have arranged for one $5000 bond, under which all will operate. This interpretation of the ordinance makes it appear that one bond serves for all thirty-two vehicles, any action against any one of the thirty-two being protected by the bond. In case of accidents or other damages, the jitneys will have to secure another bond before they can begin operations. The individual chauffeurs' licenses have all been paid in the thirty-two cases.

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3½-Cent Jitney Rides

CPOKAN, WASH., July 3—Three-and-one-half-cent-fare automobiles began operating on the Spokane streets yesterday. The cars seat ten passengers. Books containing tickets for 100 rides are being sold for $3.50.

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Bowser Receives Exposition Award

SOUTH BEND, IND., July 3—The International jury of awards of the Panama-Pacific International Exposition awarded to S. F. Bowser & Co., Fort Wayne, the grand prize, and also a gold medal on the company's self-measuring pumps and storage tanks.

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Stoops Manages Vanguard

DETROIT, MICH., July 3—H. J. Stoops has been appointed general manager of the Vanguard Manufacturing Co., manufacturer of windshields. Mr. Stoops was formerly with the Trumbull Cyclecar Co., and the Detroit agency of Emil Grossman.

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Thomas Resigns from Dauch

SANDUSKY, OHIO, July 3—F. W. Thomas has resigned as chief engineer with the Dauch Mfg. Co., to take the position of chief engineer and factory manager with Clark Engine & Boiler Co., Kalamazoo, Mich.

Factory Miscellany

Perry Top Moves—The Perry Auto Top Co., Columbus, Ohio, has removed to a large factory at 220 North Third Street.

Mogul Truck Builds—The Mogul Truck Co., 6100 Maple avenue, St. Louis, Mo., has bought a site 125 by 187 feet and will erect a plant for the manufacture of trucks.

Leather Co. to Build—The Lackawanna Leather Co., Hackettstown, N. J., manufacturer of automobile and carriage leathers, will build a two-story addition to its plant.

Detroit Steel Adds—The Detroit Pressed Steel Co., Detroit, Mich., will spend about $25,000 for the erection of a two-story office addition, 56 by 130 feet, and a one-story steel frame factory addition, 57 by 185 feet.

Ford Lets Contract for L. I. Plant—Ford Motor Co., Detroit, has let a contract for an eight-story, 200 by 325-foot assembling plant in Long Island City, N. Y., plant having been under contemplation for some time.

Fisk Rubber Adds—The Fisk Rubber Co., Chicopee Falls, Mass., has awarded the contract for the construction of a 50 by 160 ft. office building, a 110 by 310 ft. storehouse and a 60 by 100 ft. garage. The estimated cost is $400,000.

Standard Four Tire to Move Plant—The Standard Four Tire Co., Marion, Ind., will remove its plant to Keokuk, Iowa, where $20,000 has been subscribed to secure the business. A factory will be constructed with an annual capacity of 60,000 tires.

Hamilton-Beach to Add—The Hamilton-Beach Mfg. Co., Racine, Wis., a large manufacturer of small electrical appliances, specialties and novelties, is having plans made for an important factory addition, to be 3 stories high, 50 by 250 feet in size, and cost about $30,000.

Louisville Ford Plant to Move—The Ford Motor Co. will move into its new assembly plant, Third and Railroad Crossing, Louisville, Ky., about Oct. 1. The present salesroom, now located at 931 Third Street will be vacated and the office force and show room transferred to the new building.

To Make Trailers—The Mountain Trailer Co., Spokane, Wash., has been organized by J. O. Mountain of the Diamond Carriage Co., A. H. Herta of the Signal Truck Co. and M. D. Hawkins of the Hawkins Motor Car Co. to construct a plant in Spokane to manufacture a patented trailer to hook onto an automobile.

To Manufacture Tires—The plant of the former Swift Automobile Co., Wayne, Mich., has been purchased for $13,000, it is stated, by the Automobile League of America, Detroit. The factory building is to be equipped for the purpose of manufacturing tires which are to be sold exclusively to the members of the league.

Hayes Wheel Enlarges.—The Hayes Wheel Co., Albion, Mich., which makes the hubs for the wheels made by the parent plant, the Hayes Wheel Co., in Jackson, will erect a new plant to be ready for occupancy Sept. 1. When completed the company will employ 200 men here, or double its present working force, and the production will be more than doubled. Machinery valued at $15,000 has already been purchased and by the time the new building is ready it is expected that from $50,000 to $60,000 will have been spent.

Four Wheel Drive Adds to Shop—Work is well under way on a large shop addition to the works of the Four Wheel Drive Automobile Co., Clintonville, Wis., which is working on large war orders for its quadruple drive trucks. The company is so busy turning out army cars that its domestic demand can hardly be met, and no orders are being taken for quantities until the trucks purchased by the Imperial Russian government and other European nations are delivered.

Trained Help Hard to Get—The Kissel Motor Car Co., Hartford, Wis., in common with other industries in the automobile and allied metal working trades, is experiencing difficulty in getting sufficient trained help to meet its needs. The company is advertising in the metropolitan papers for experienced machinists for milling machines, universal grinders and drill presses. All around machine hands are preferred. There is a scarcity of skilled workmen in many lines.

Will Enlarge Plant—The Empire Rubber & Tire Co., Trenton, N. J., is to inaugurate alterations and extensions in its plant with the idea of increasing production and of improving the facilities for handling it. One new building is in the course of erection at the present time. A siding is also being run from the tracks of the Pennsylvania Railroad direct to the shipping room. Changes and improvements to be made in the shipping room will mean a big facilitation in delivery. The need of extra room is demonstrated by the fact that in the tire building department the men are being worked in three 8-hour shifts.

The Automobile Calendar

July 9	Burlington, Ia., 100-Mile Track Race; Tri-State Fair.
Aug.	Milwaukee, Wis., Independent Petroleum Marketers' Assn. of the U. S.; 1915 Convention in Milwaukee.
Aug. 2-3	San Francisco, Cal., Tri-State Good Roads Assn., Third Annual Convention.
Aug. 20-21	Elgin, Ill., Road Races.
Aug. 30	Columbus, O., Show, Ohio State Fair, Columbus Auto. Show Co.
Sept.	Indianapolis, Ind., Fall Show, Indiana State Fair.
Sept.	Peoria, Ill., Second Northwestern Road Congress.
Sept. 6	Providence, R. I., Speedway Race; F. E. Perkins.
Sept. 6	Detroit, Mich., Speedway Race; Detroit Speedway Club.
Sept. 6	Indianapolis, Ind., Show, Indiana State Fair.
Sept. 8-11	Hamline, Minn., 2-Day Meet at State Fair Grounds between Minneapolis and St. Paul, State Fair.
Sept. 13	Oakland, Cal., Pan-American Road Congress.
Sept. 17-18	Peoria, Ill., Illinois Garage Owners' Assn. Convention.
Sept. 20-25	San Francisco, Cal., International Engineering Congress.
Sept. 18-25	Los Angeles, Cal., Show, Shrine Auditorium.
Oct.	St. Louis, Mo., Show, Forest Park Highlands, St. Louis Automobile Manufacturers and Dealers' Assn.
Oct. 1	Minneapolis, Minn., Track Race, Twin City Motor Speedway Co.
Oct. 1-2	Trenton, N. J., Track Races; Inter-State Fair.
Oct. 2	New York City, Sheepshead Bay Motor Speedway Track Meet.
Oct. 6-16	New York City, Ninth Electrical Exposition and Motor Show at Grand Central Palace.
Oct. 9	Chicago, Ill., 300-Mile Race.
Oct. 11-12	Dayton, O., National Paving Brick Manufacturers' Assn., Annual Meeting.
Nov. 18	Arizona 150-mile Grand Prix.
Dec. 31	New York City, Show; Grand Central Palace.
Jan. 22, 1916	Chicago, Ill., Show; Coliseum.
March 4-11	Boston, Mass., Truck Show, Mechanics Bldg.

The Week in the Industry

Nelke Takes on Oakland—A. W. Nelke, who handled the Overland in Western Maine for some years, has given it up and he now has the agency for all Maine for the Oakland. He is making his headquarters at Lewiston.

Peck Resigns—W. V. Peck, formerly Chicago representative of the Pittsburgh Model Engine Co., Pittsburgh, Pa., is no longer connected with the company. Hereafter the sales in Chicago and vicinity will be handled direct from the plant.

Caten Makes a Change—E. L. Caten, who was identified with the Buick in Worcester, Mass., for some years has taken over the agency for the Paige Detroit in that city, and a company has been formed with J. H. and W. A. Stratton as partners.

Sommerville General Mgr.—A. G. Sommerville has bought the controlling interest in the Argonaut Motors Co., San Francisco, Cal., and will hereafter act as the general manager. This concern distributes the Stearns and Pathfinder in Northern California.

Parker Heads Hartford Olds.—Representation of the Oldsmobile is now vested in the Parker Oldsmobile Co., Hartford. F. R. Parker of New Haven, is the head of the concern. W. G. Murray, formerly with the sales department of the Palace Auto Service Co., has joined the Parker company.

Morrison Heads Louisville Co.—The Louisville Speedometer Co. has opened a service station for Stewart speedometers and Warner autometers at 935 Third Street, Louisville, Ky. J. H. Morrison, head of the concern, formerly was manager of the service department of the Stewart-Warner Indianapolis branch.

Banks Ford Louisville Manager—Clarence Banks, assistant manager of the Louisville branch of the Ford Motor Co. for several years, has been appointed manager, succeeding F. H. Peabody. Mr. Banks formerly had the Ford agency in Louisville, but became associated with the Ford company's Kentucky branch when it was established in 1911.

Stockwell Heads Power Gas Co.—The Power Gas Products Co., capitalized at $125,000, has been reorganized. A branch is in Detroit, Mich. The company makes automobile chemicals. Officers are: President, S. A. Stockwell; vice-president, E. H. Sherwin; secretary, C. F. Heberle; treasurer, J. S. Calder; directors, T. O. Ofstun of Glenwood, Minn.; A. J. Edwards, and George Wollman, sales manager at Detroit.

Motor Men in New Roles

DeVoe Chevrolet Pacific Representative—N. DeVoe, formerly well-known and associated with the trade in Portland, Ore., is now Pacific Coast representative for the Chevrolet.

Snow in Charge—R. H. Snow is now in charge of the truck department for the Western Motors Co., Spokane, representatives of Stewart trucks.

Bury Makes Change—F. J. Bury, formerly connected with the Packard Motor Car Co.'s service department at Detroit, is the new assistant manager of the Southern Motors Co., Louisville, Ky.

Cotton Joins Saxon—Clifford C. Cotton has been appointed special city sales representative of the Saxon car in Toledo, Ohio. He was formerly connected with the Stalker Advertising Agency.

Cronkhite with Philadelphia Oakland.—W. D. Cronkhite has been appointed district representative with headquarters in Philadelphia by the Oakland Motor Co. He was at one time connected with the Buick company.

Huntley Succeeds Histed—R. D. Huntley has succeeded J. R. Histed as manager of the J. I. Case branch in New York City. Huntley was formerly in charge of the Peoria, Ill. branch. A. G. Kellam has succeeded Huntley at Peoria.

Gargett Cleveland Mgr.—R. B. Gargett, formerly connected with the Motor Tire & Supply Co., Cleveland, has been made manager of the Electric Equipment Co., Cleveland distributor for Ohio for Westinghouse starting and lighting apparatus.

Gogarn Takes on Mitchell—J. W. Gogarn, who was identified with the Reo in New York for some years and has been agent for Ajax tires in New Haven, Conn., for more than a year, has branched out and taken on the agency there for the Mitchell line.

Selleck Joins Strauss Service—G. K. Selleck has been added to the forces of the Strauss Service Systems in Indianapolis, Ind. Mr. Selleck will have charge of the rim department of the Strauss company, and will be manager of the rim department.

Newsum Tire Service in Louisville—Thornton Newsum, of Memphis, Tenn., who operates a string of ten tire establishments in a number of large cities, has entered the Louisville field and opened a store, known as Quick Tire Service, at the Northwest corner of Third Street and Broadway. Mr. Newsum is president, C. T. Ballard, Jr., secretary, and R. E. McCaugh manager.

Irwin Goes to Portland—J. H. Irwin, formerly of Seattle, will take charge of the sale of Kelly-Springfield tires in Portland, Ore., which are handled by the Oregon Motor Car Co. M. L. Gallagher has been promoted to the position of sales manager for the Oregon Motor Car Co., succeeding D. C. Warren.

Kessler Joins Brooklyn Packard.—S. W. Kessler, who has been for several years sales manager for the I. S. Remson Automobile Co., Abbott-Detroit, and Westcott distributor in Brooklyn, N. Y., has joined the sales force of the Brooklyn branch of the Packard Motor Car Co. of New York. He will be a special sales representative.

De Vaux Takes Chevrolet Agency—Norman de Vaux, for many years past head of the Reo Pacific Co., California distributor of the Reo line, is no longer distributor of the Lansing car in San Francisco. He has taken over the coast agency of the Chevrolet car. He will change the style of his firm to the Chevrolet Car of California. De Vaux has taken with him most of his agents that handled the Reo line.

Teague Makes Milwaukee Connection—R. N. Teague, for eight years associated with agencies in Milwaukee, has purchased an important interest in the Milwaukee Motor Sales Co, Milwaukee, Wis., and upon its reorganization was elected secretary, treasurer, and general manager. The company is State agent for the Lewis VI and was recently named general agent for Milwaukee County for the Oakland. The garage and offices are at 239-241 Wisconsin Street.

Bush Resigns from Velie.—R. R. Bush, who joined the Velie Motor Vehicle Co., Moline, last August, as sales manager, and was later made general manager of the company, has resigned his position and will leave shortly for Kansas City where he will engage in the automobile business for himself. Mr. Bush has associated with him in his new venture W. H. Morgan, who came to the Velie company with Mr. Bush and was appointed local territory sales manager. The new Kansas City firm will be known as the Bush-Morgan Motor Co., Inc., and quarters at 1526 Grand Avenue, have been secured. Mr. Morgan has been succeeded by H. B. Daniels. The successor to Mr. Bush has not been decided on as yet.